FOUNDRY TRADE JOURNAL

EST. 1902

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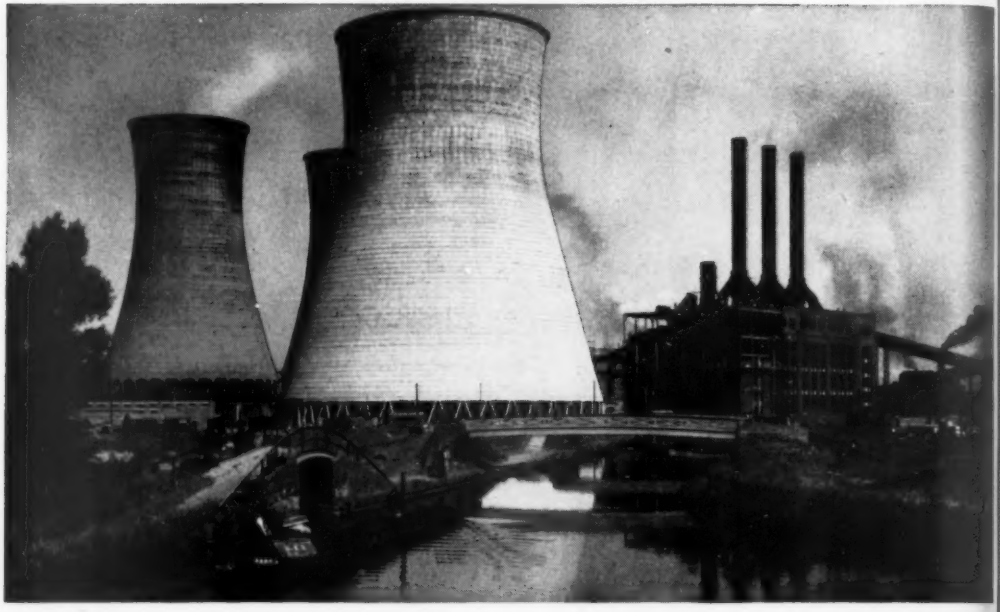

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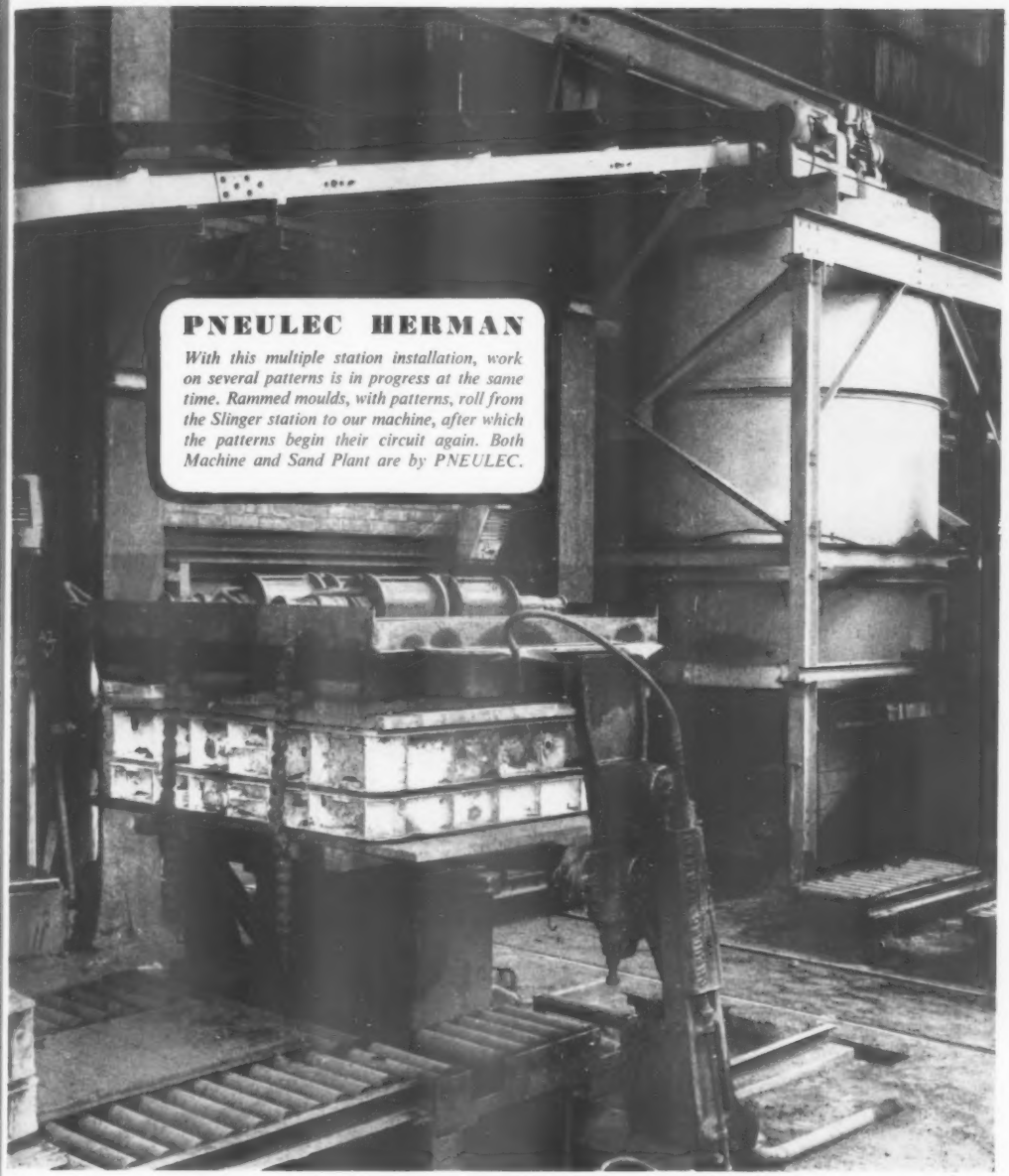
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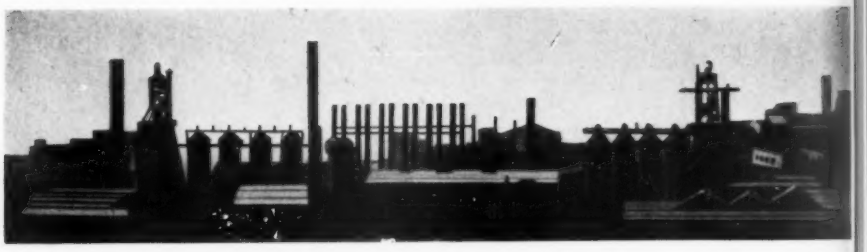

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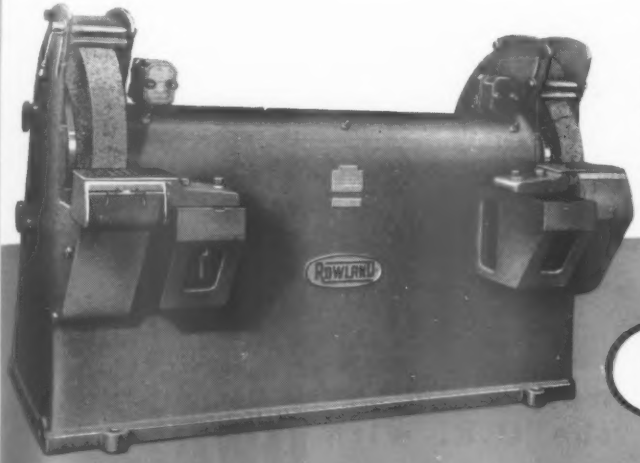

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These machines embody either the B.S.C.R.A. or the B.C.I.R.A. Patent Systems of Dust Control and comply with the new Government Regulation 1 of the Grinding of Metals (Misc. Indus.) Regulations, and Regulation 7, para. (6) of the Iron and Steel Foundries Regulations, 1953.

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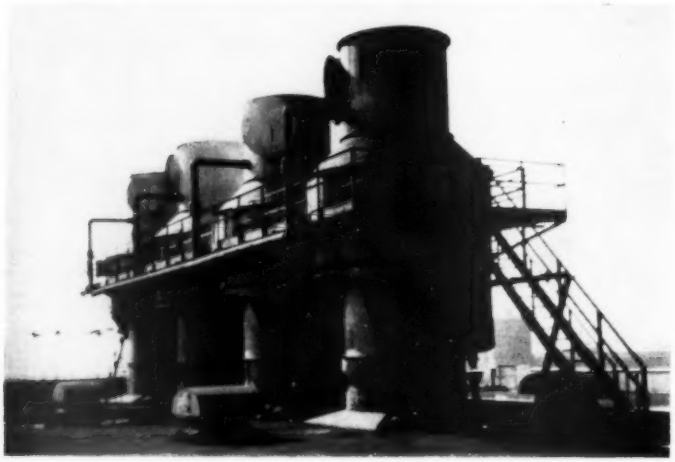

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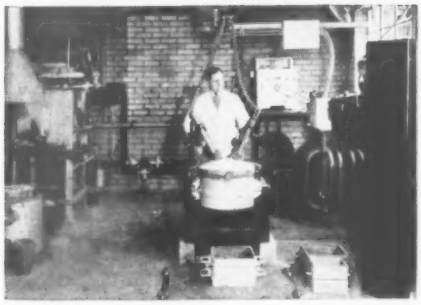

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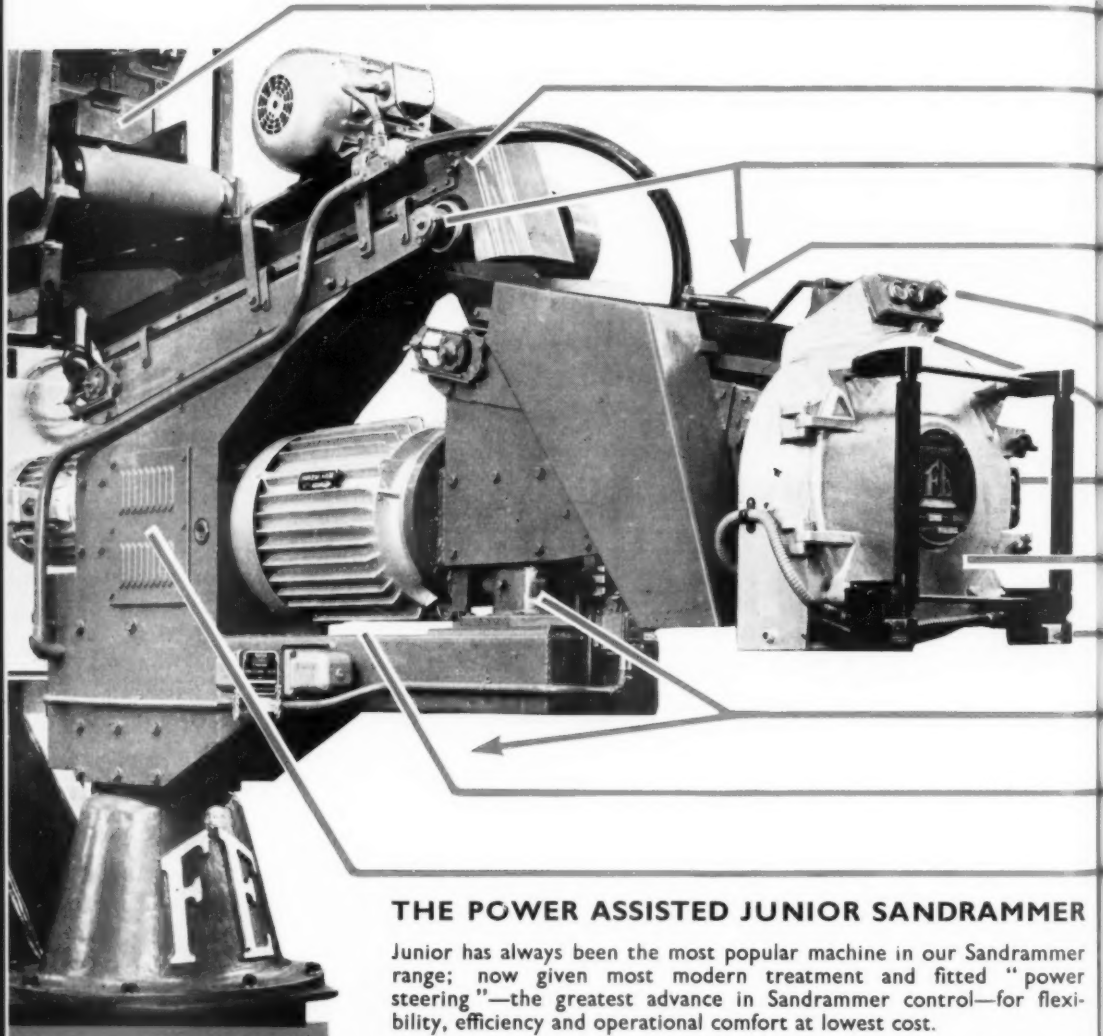

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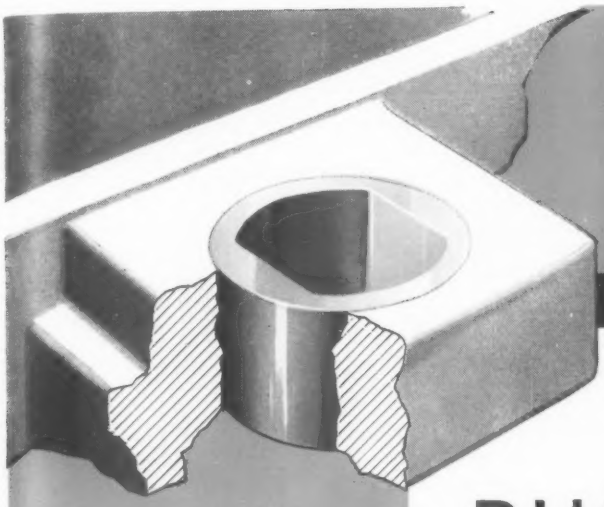

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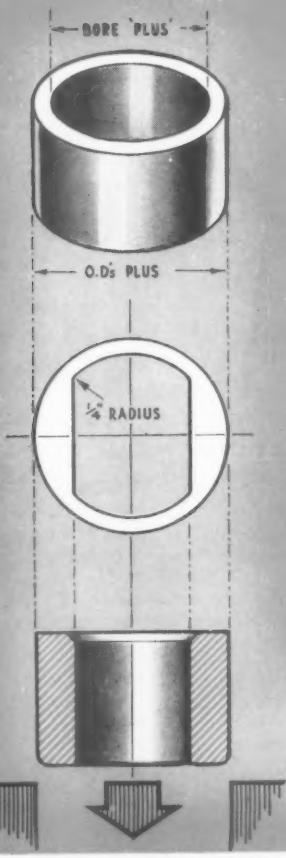

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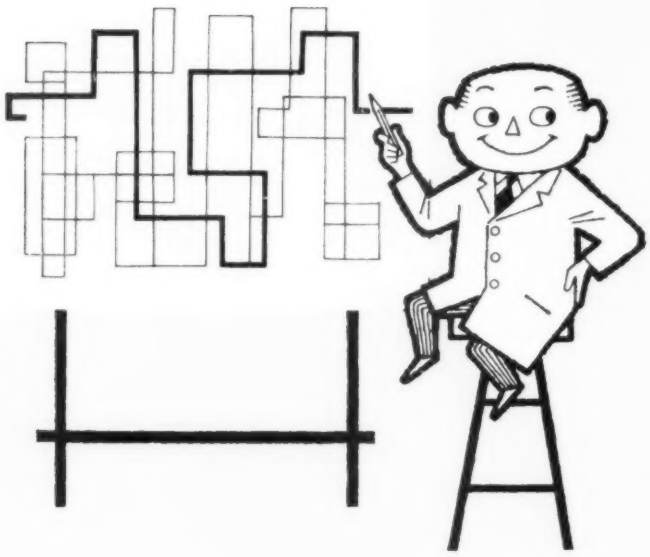

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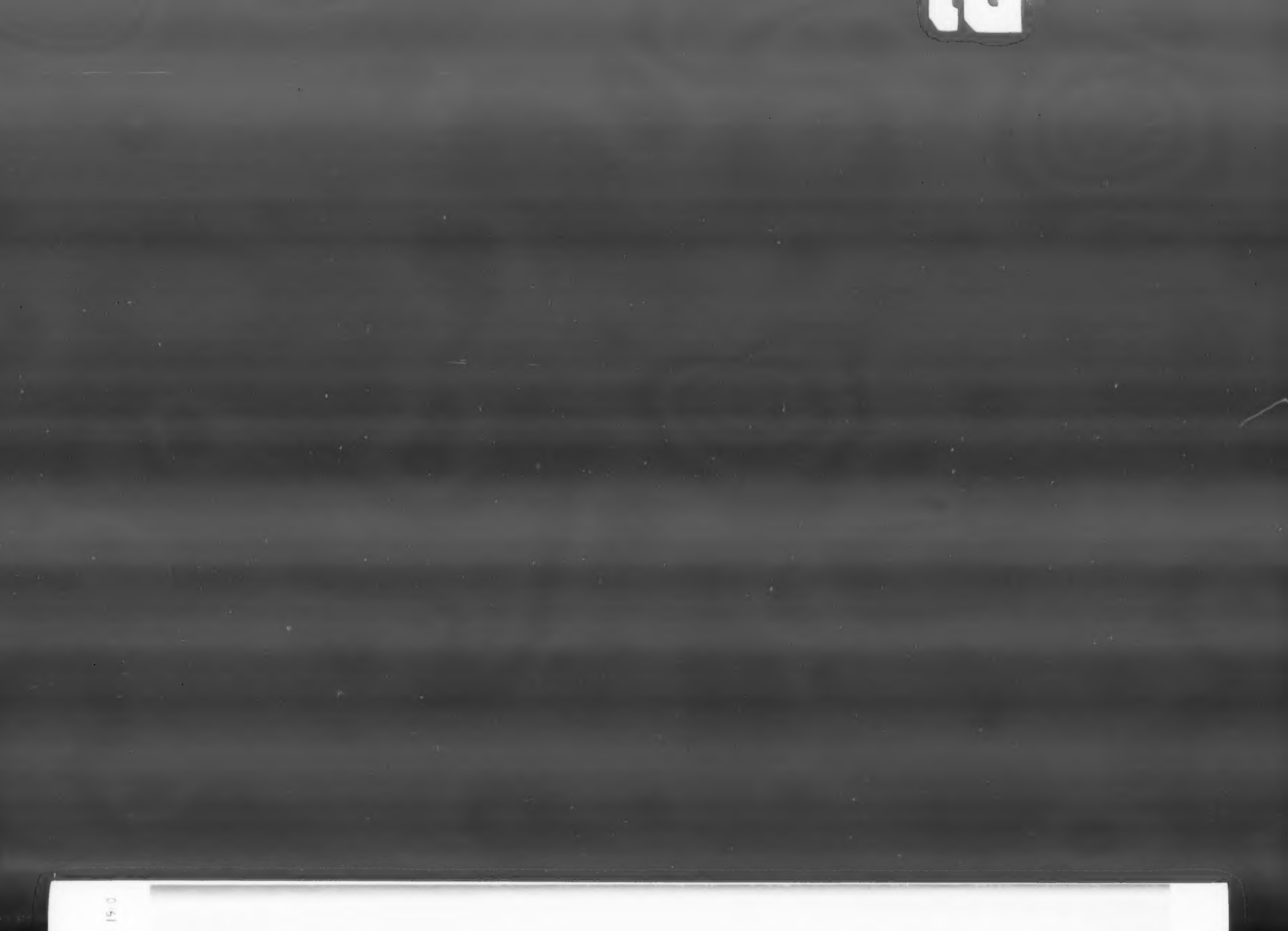

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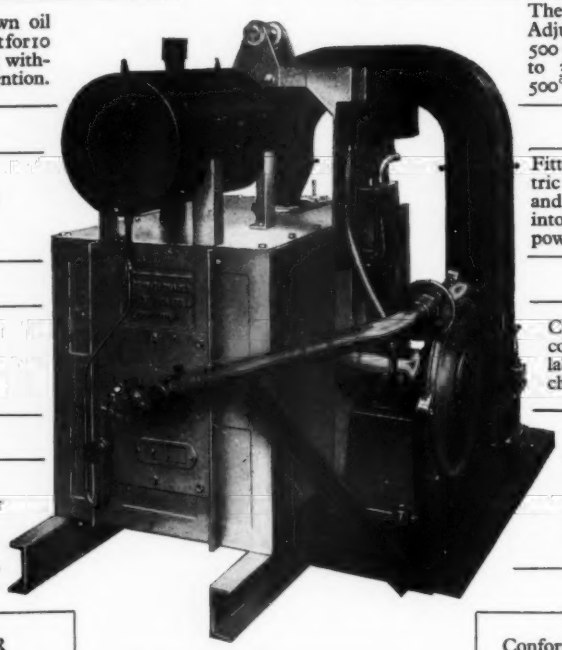

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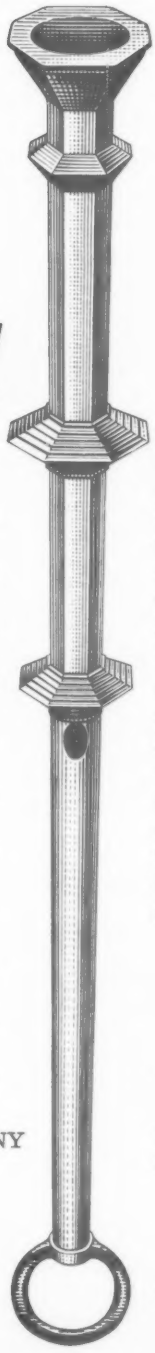
Mace-pistol



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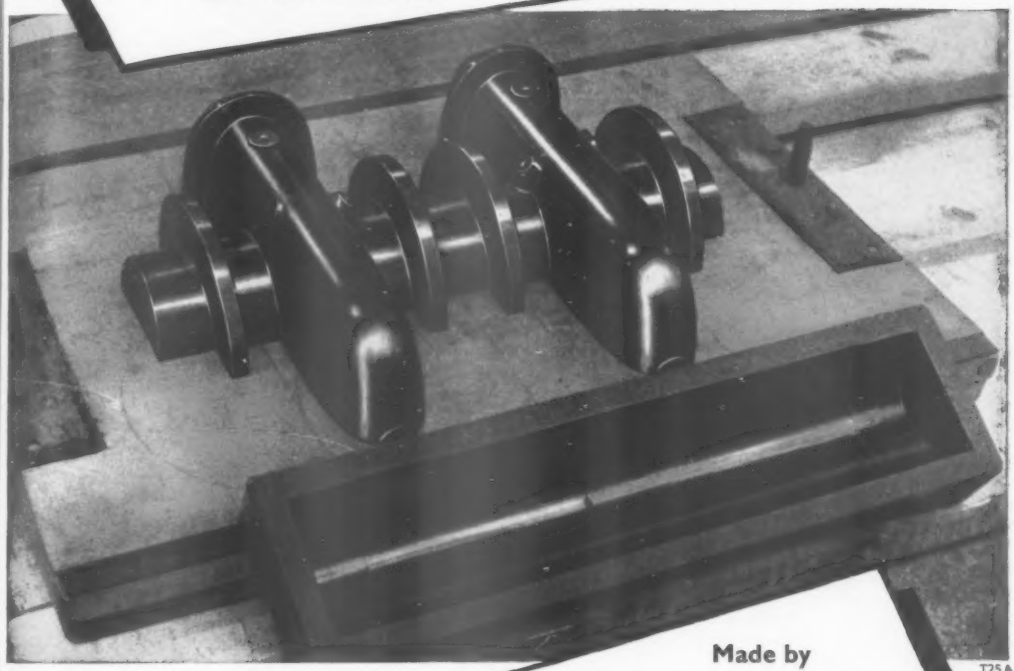

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however intricate and difficult the pattern; it is also
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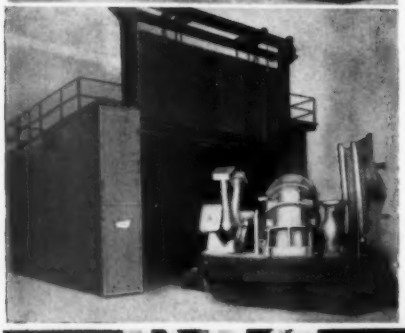
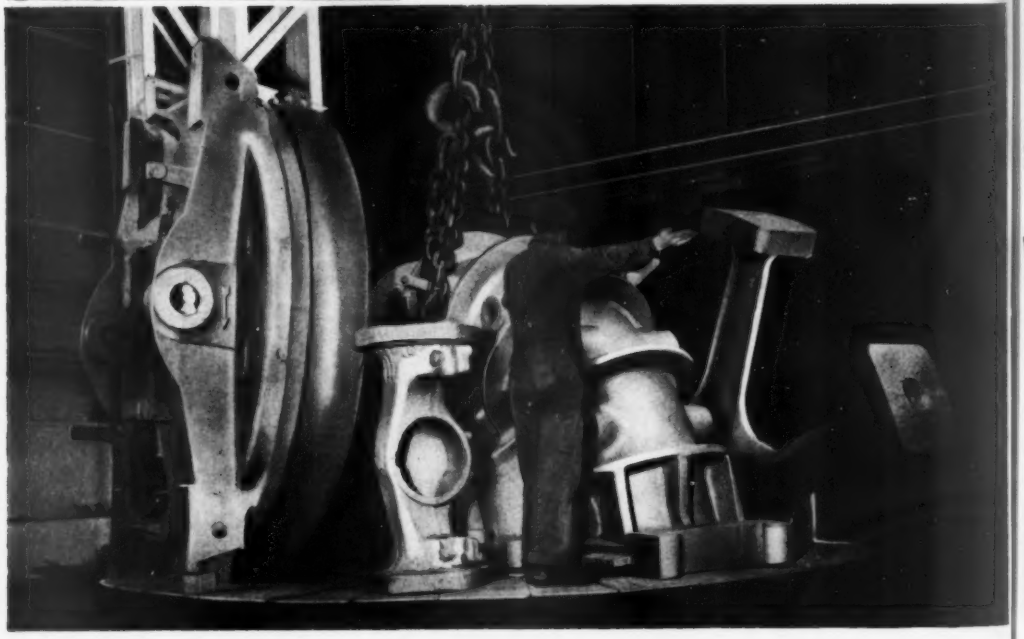


The World's Largest Mechanical

Shot Blast Room Plant

The Tilghman's Wheelabrator Room Plant shown in the accompanying illustrations is 30ft. by 25ft. by 16ft. high, and is installed at Messrs. F. H. Lloyd and Co. Ltd., Wednesbury. This plant, which is fitted with five Wheelabrator units, handles the production from two large bays, the components being loaded on to a bogie equipped with a circular table. Rotating and oscillating motions are provided to the bogie during the cleaning cycle, ensuring maximum blast coverage.



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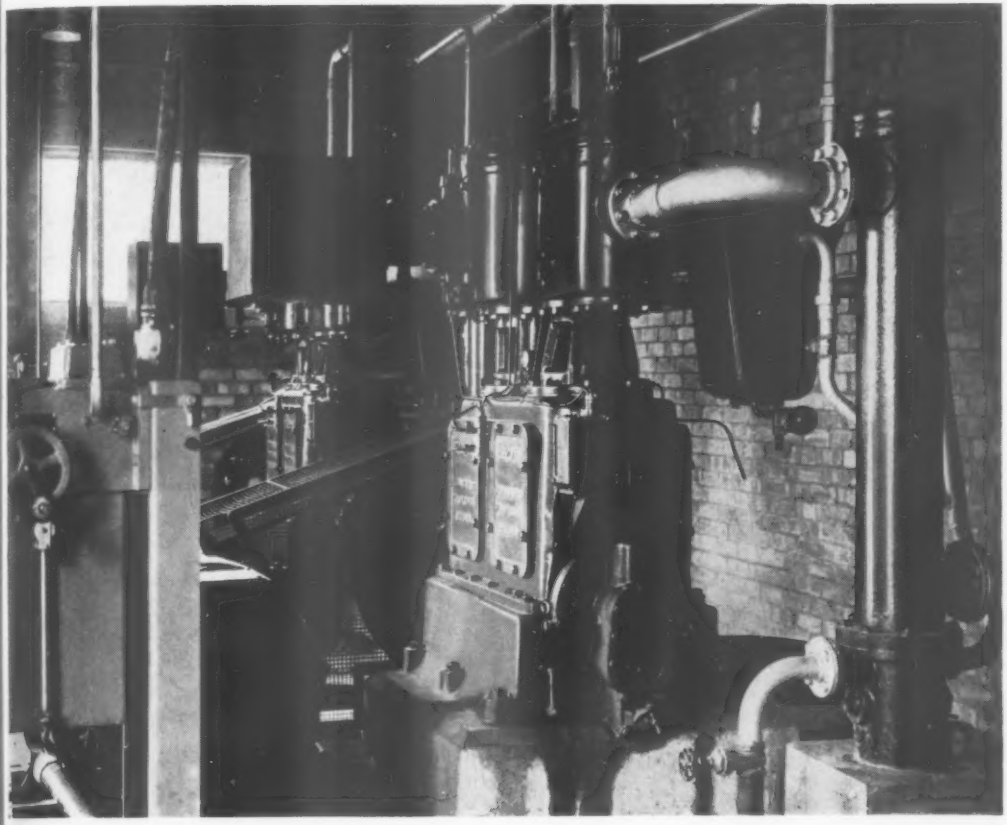

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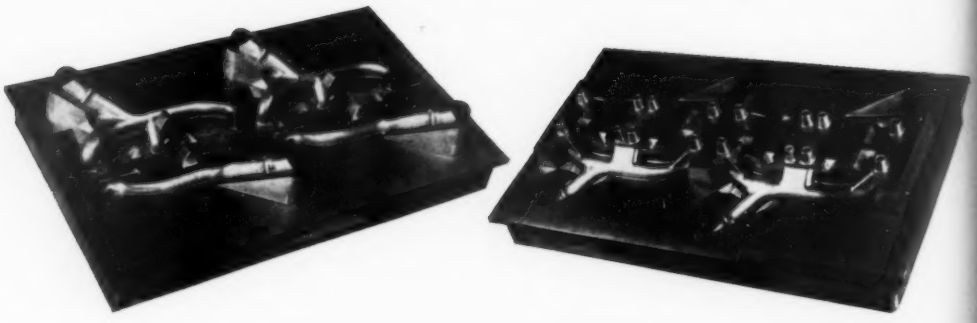

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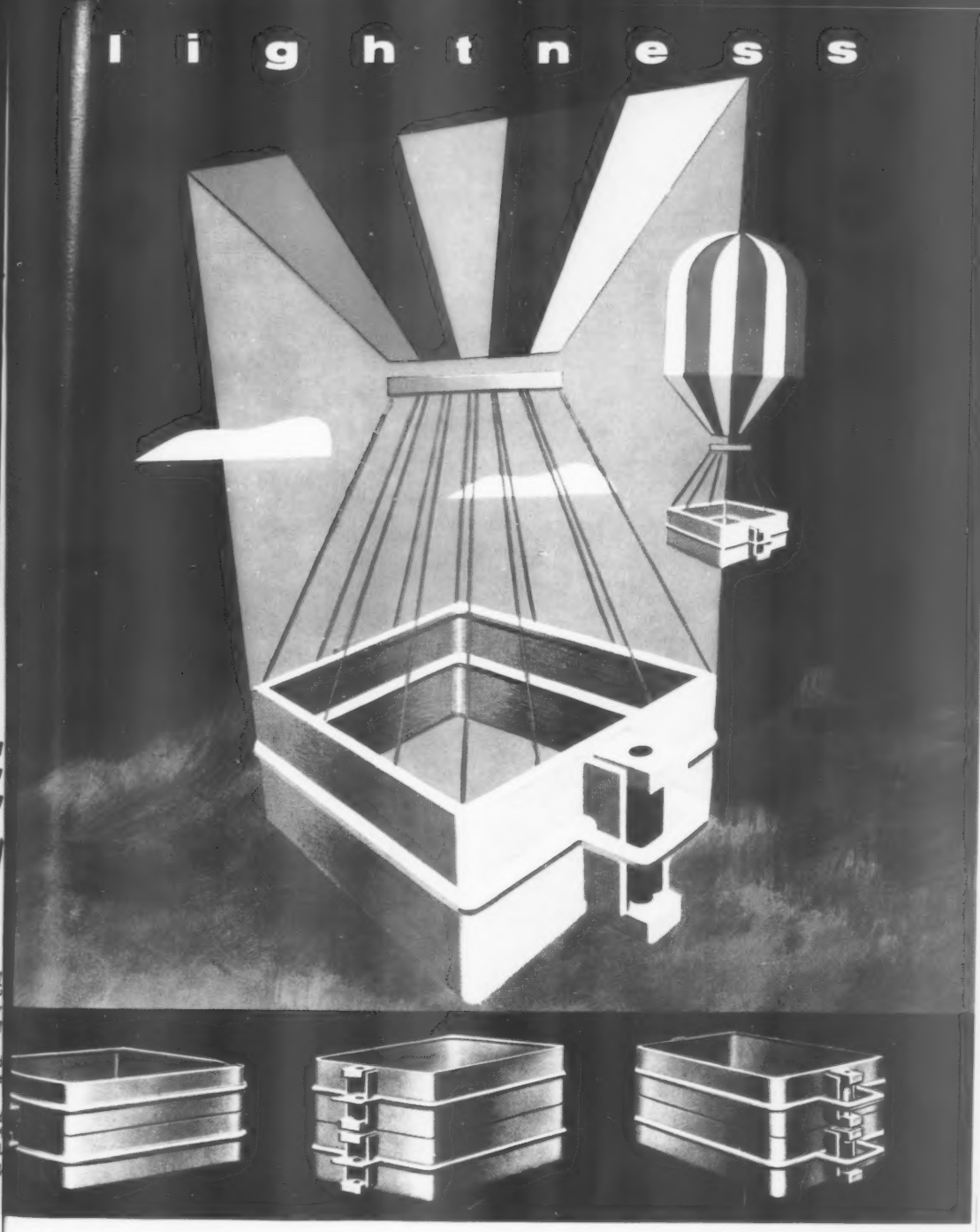

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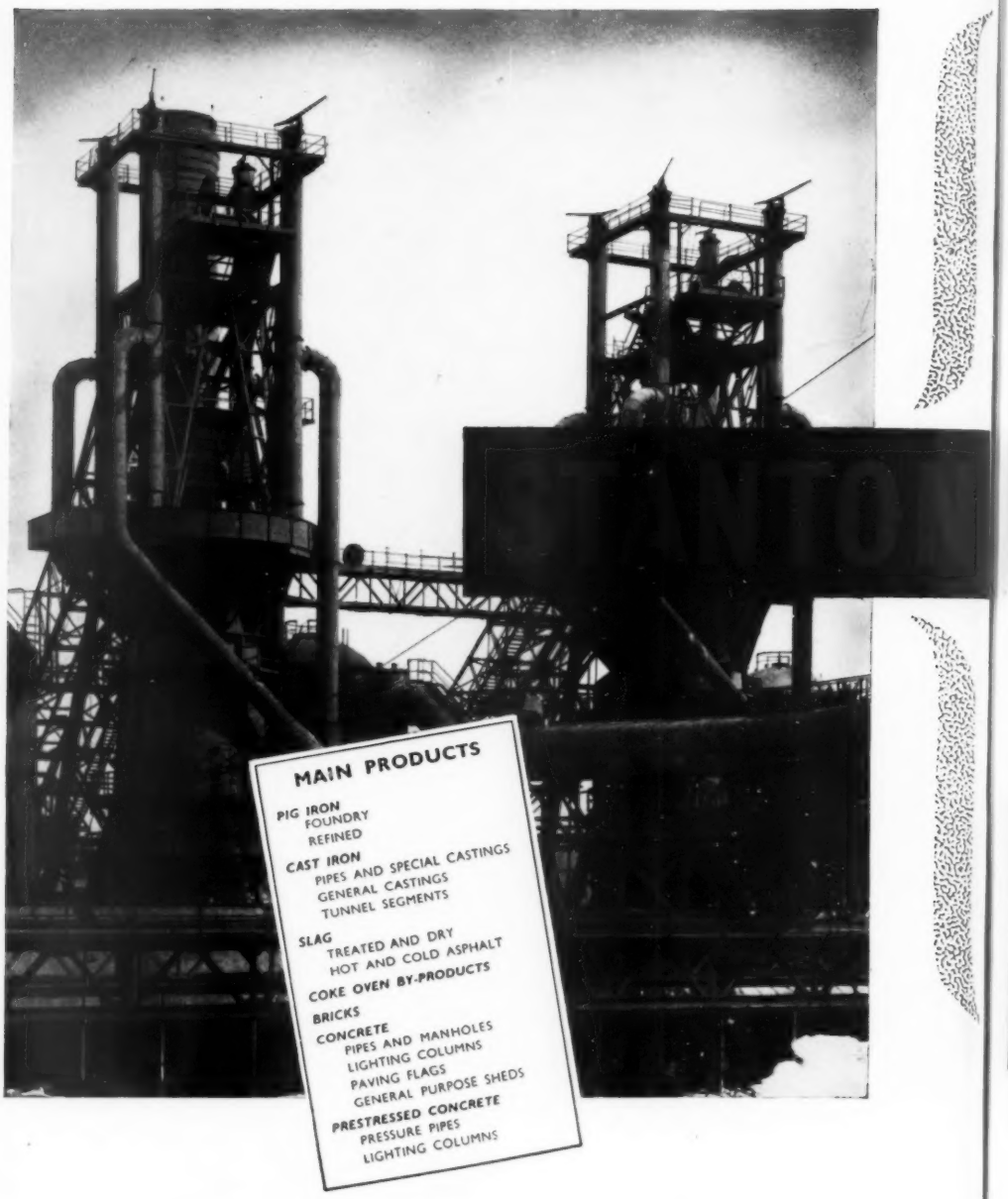

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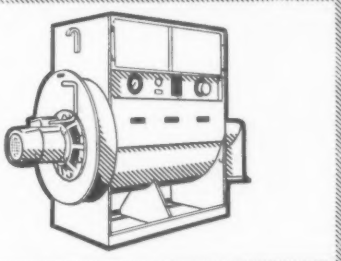

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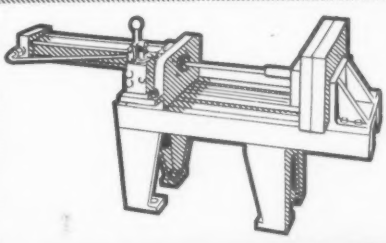

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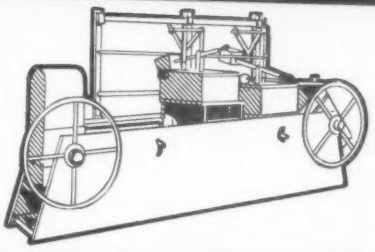

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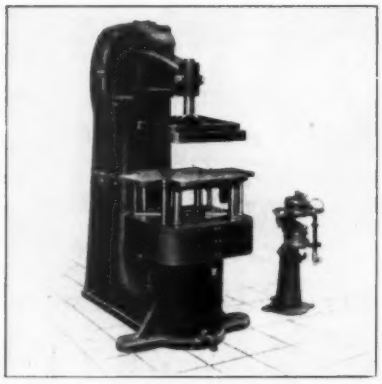

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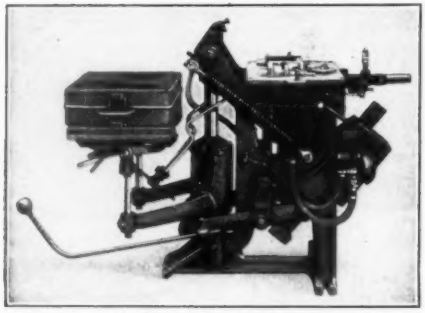

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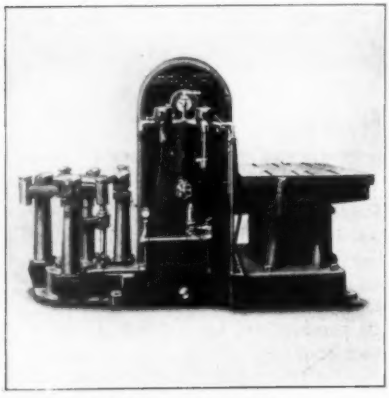

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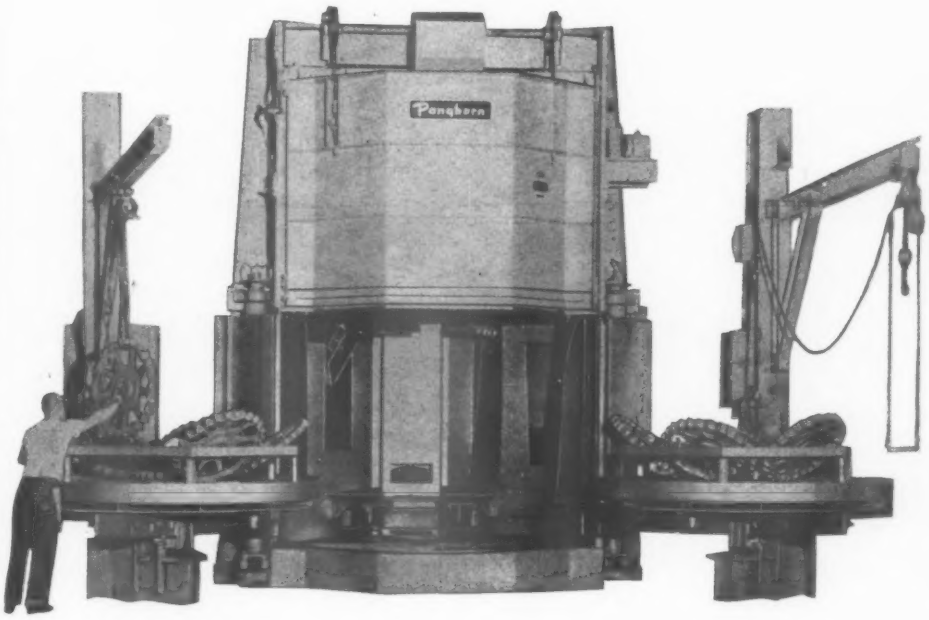

illustration of 8′ 0″ diameter
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Machine	Dia.		Height		Weight
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6 LM	6′ 0″	×	3′ 0″	×	4,000
8 LM	8′ 0″	×	3′ 6″	×	10,000
8 LM-1	8′ 0″	×	5′ 0″	×	12.000

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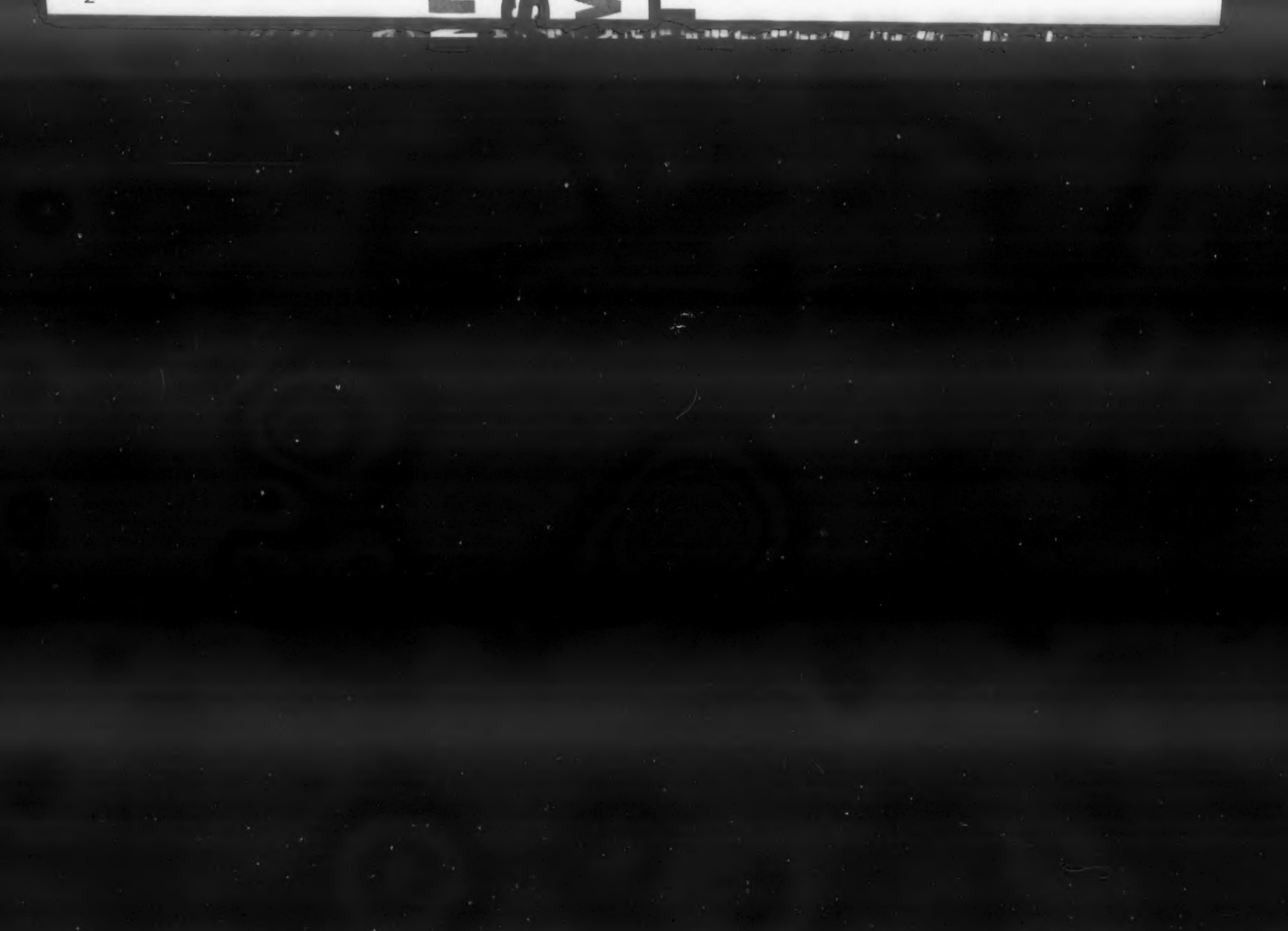

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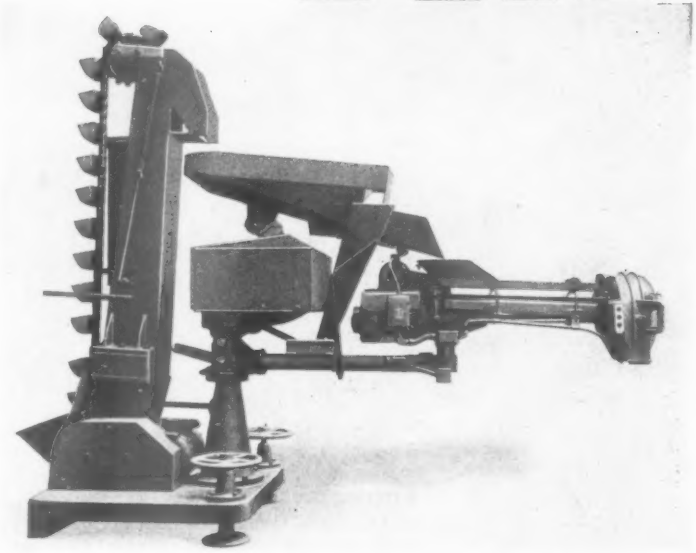

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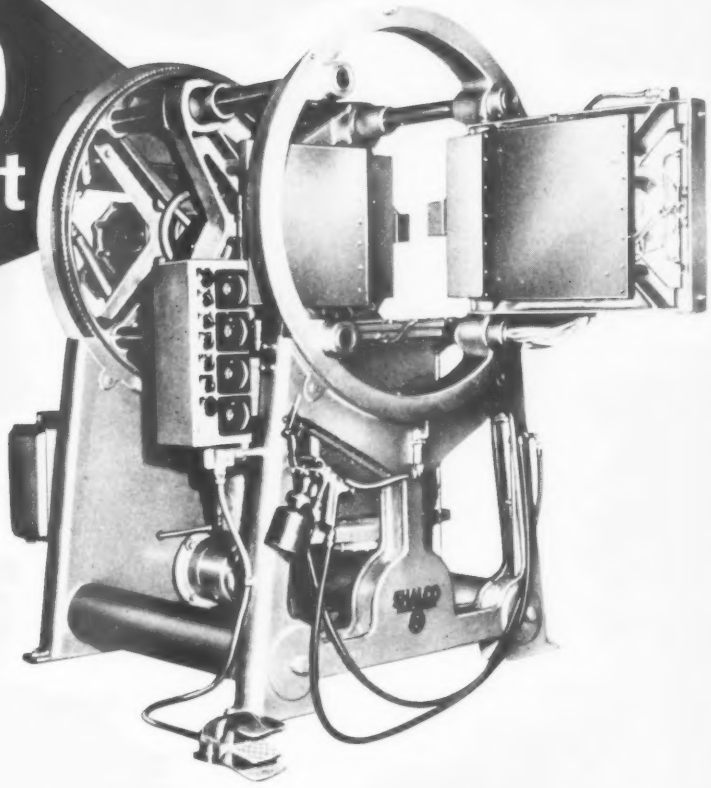

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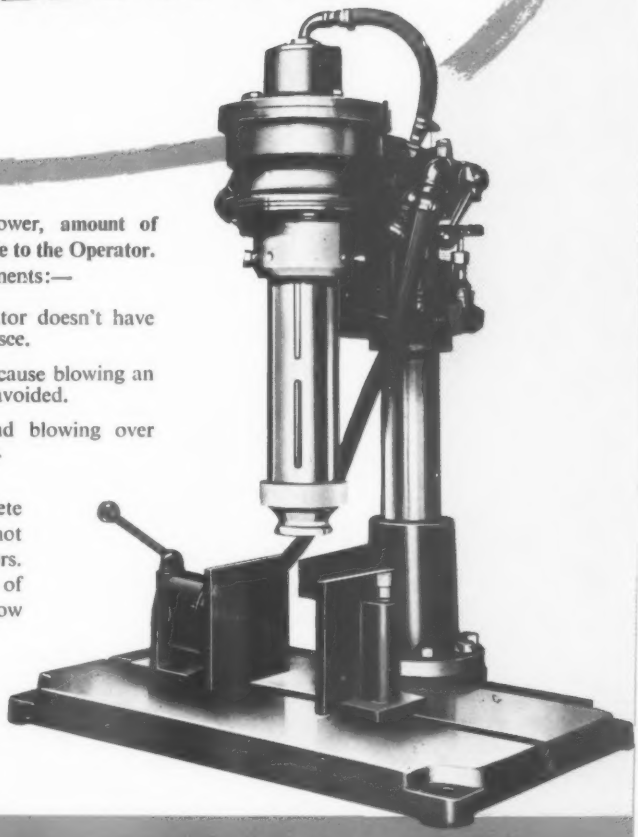

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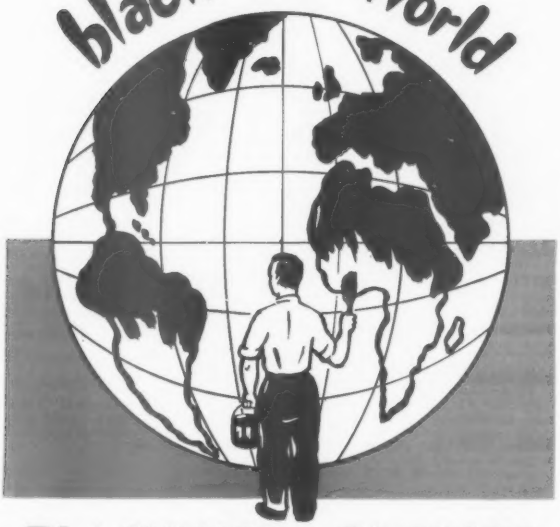

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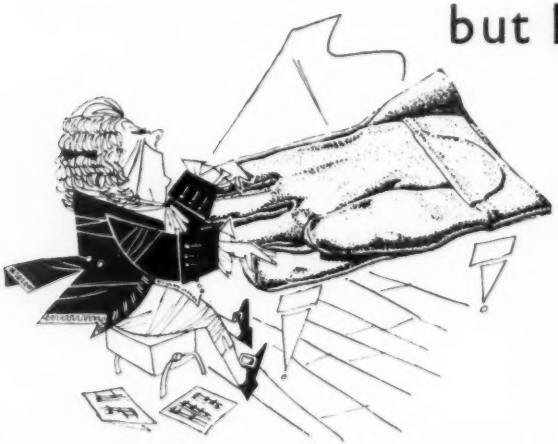

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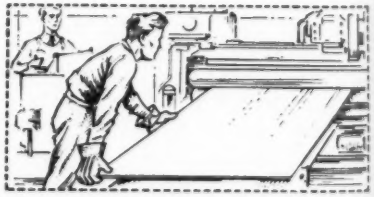

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The foundry industry of the United Kingdom is represented by the following organizations, many of whose proceedings are regularly reported in this JOURNAL:—

Ironfounding Employers' Associations

COUNCIL OF IRONFOUNDRY ASSOCIATIONS

Chairman: **M. J. Glenny,** Dover Engineering Works, Limited, Talbot House, Arundel St., London, W.C.2. *Director:* **K. Marshall.** *Ass. Director:* **J. W. Butler.** *Secretary:* **D. L. Farrant,** 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7171. *Participating Associations:* British Cast Iron Research Association (affiliated); Institute of British Foundrymen (affiliated); and the following:—**Association of Automobile and Allied High-duty Ironfounders.** Secretaries, Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15. 'Phone: Edgbaston 4141. 'Grams: "Clarify," Birmingham, 15. **British Ironfounders' Association and British Bath Manufacturers' Association.** Director and Secretary: J. Galbraith Sneddon, C.A., 145, St. Vincent Street, Glasgow, C.2. 'Phone: Central 2891. 'Grams: "Groundwork," Glasgow. **British Grit Association** (affiliated).—Secretary: J. Campbell MacGregor, 10, Bank Street, Airdrie, Lanarkshire. **British Malleable Tube Fittings Association.**—Secretary: F. B. Ridgwell, 196, Shaftesbury Avenue, London, W.C.2. 'Phone: TEMple Bar 6052-3. 'Grams: "Brimastuffa," London. **Cast-Iron Chair Association.**—Secretaries: Peat, Marwick, Mitchell & Co., The Cast Iron Chair Association, Queen's Square, Middlesbrough, Yorkshire. **Cast Iron Axlebox Association and National Ingot Mould Association.**—Secretaries: Peat, Marwick, Mitchell & Company, 301, Glossop Road, Sheffield. 'Phone and 'Grams: Broomhill 63031. **Cast Iron Heating Boiler and Radiator Manufacturers' Association.**—Secretary: Stanley Henderson, 69, Cannon Street, London, E.C.4. 'Phone: CITy 4444. **British Cast Iron Pressure Pipe Association.**—Secretary: W. I. Campbell, 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7941. **Cast Iron Segment Association.**—Secretary: W. Rose, Stanton Ironworks Company, Limited, P.O. Box 3, near Nottingham. **Greensand Pipe Founders' Association.**—Secretaries: McClure Naismith Brodie & Company, 77, St. Vincent Street, Glasgow, C.2. 'Phone: Glasgow 9476. 'Grams: "Lycidasm," Glasgow. **National Association of Malleable Ironfounders.**—Secretary: Miss L. Verity, M.B.E., Chamber of Commerce Offices, Tudor House, Bridge Street, Walsall. 'Phone: Walsall 5671. **National and Midland Ironfounders' Association.**—Secretary: F. W. Sims 69, Harborne Road, Edgbaston, Birmingham, 15. **Roll Makers Association of Great Britain.**—Secretaries: Peat, Marwick, Mitchell & Company, Beaufort House, Newhall Street, Birmingham, 3. 'Phone: Central 6661-3.

NATIONAL FEDERATION OF ENGINEERING & GENERAL IRONFOUNDERS

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Alvechurch, Birmingham. 'Phone and Grams: Redditch 716.

Scottish Laboratories: Blantyre Industrial Estate, Blantyre, Lanarkshire. 'Phone 486.

BRITISH STEEL CASTING RESEARCH ASSOCIATION

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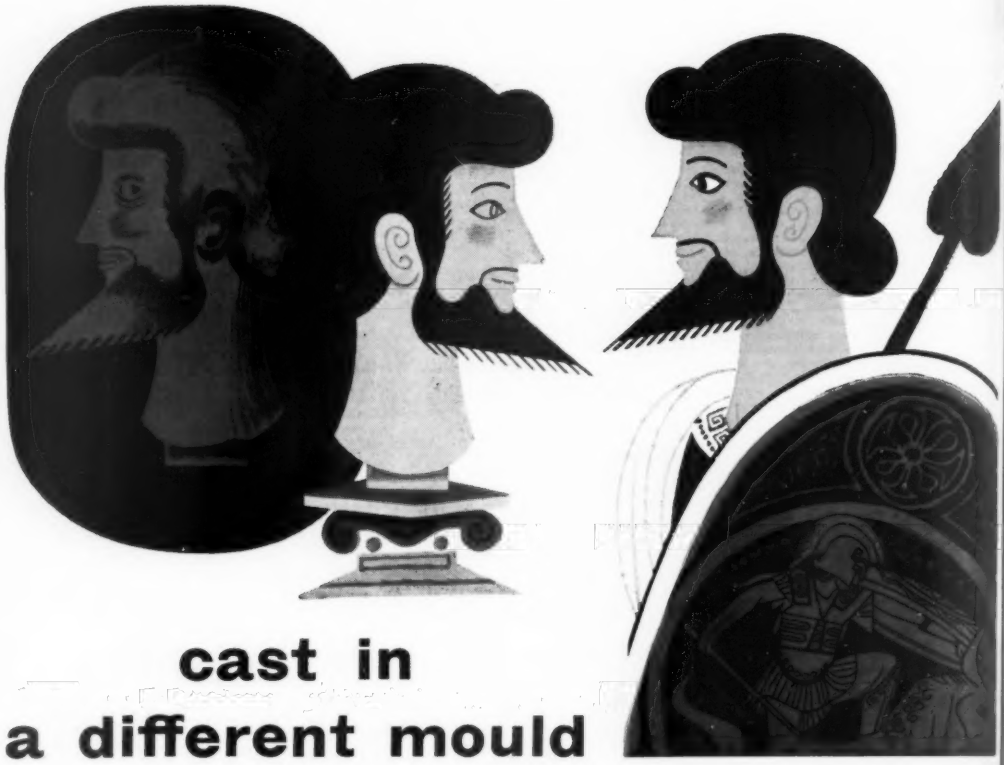

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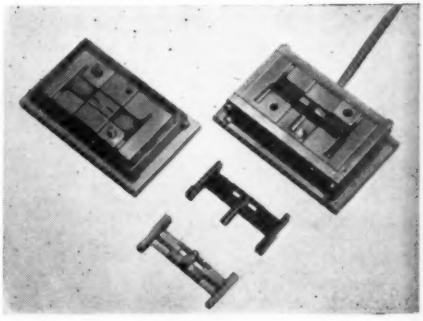

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District Representatives:
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T. H. SMITH (Scotland) 'phone: Dumbarton 1046
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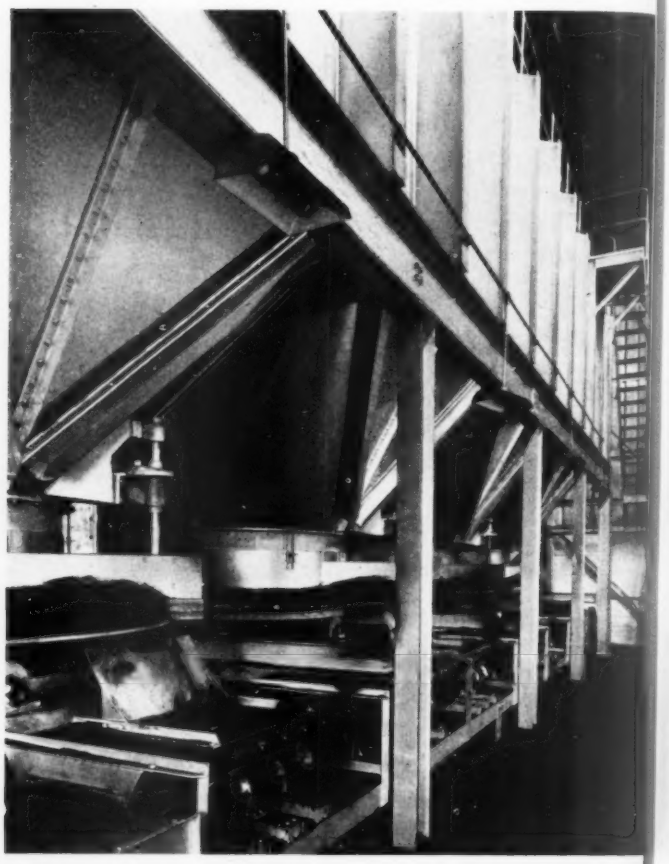

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FOUNDRY
TRADE JOURNAL

Vol. 108 March 17, 1960 No. 2258

UK Foundry Production in 1959

In the early part of last year, any estimate of the production of major divisions of the UK foundry industry would have been on the low side, except perhaps for steel and magnesium castings. In actual fact, gains over the 1958 production were registered for iron castings of 29,440 tons, to give a total of 3,498,000 tons for the year; copper-base cast alloys, at a total of 74,947 tons had gained 1,021 tons and light-alloy castings at 93,700 tons gained 2,600 tons. On the other hand, the total production of steel castings at 254,260 tons was lower than 1958 by 32,940 tons, whilst the output of cast magnesium-base alloys at 1,800 tons was distinctly lower than the average of recent years.

Whilst the selling prices of many types of iron castings are still too low compared with their cost of production, yet we are convinced that the average sales value is increasing, because of the higher level of prices obtained for spheroidal-graphite iron, shell-moulded castings, and other types of better-class castings, but these figures are not available annually. A glance at the Council of Ironfoundry Association's figures shows worthwhile increases in the production of iron castings entering into the high-price range, such as automobile castings and the like. The brass and bronze foundry section has had a reasonably good year, but still not up to the 1956 and 1957 productions. Copper-base-alloy founders are complaining that they are losing markets to other industries, such as powder metallurgy and plastics. Aluminium-alloy founders on the other hand experienced a record year and the time is not far distant when this industry will be producing a hundred thousand tons per year. Since 1941, the production tonnage has just about trebled itself. The production of light-alloy sand castings now stands in the third position with gravity- and pressure-die-castings leading in that order.

Steelfounders have not had such a low production total since 1950, yet we believe that the basic structure of this industry is sounder to-day than ever before. It used to be stated that the production of steel castings was a war barometer, but to-day steelfounders are catering for a wide diversity of industries and moreover doing so very intelligently. Price-cutting, which once reduced the steel section of our industry to near bankruptcy is not outstandingly vicious to-day. Because of the increasing use of quite small investment-moulded castings and the expanded applications of alloy-steel castings, the average value of the production here is also increasing.

Forthcoming Events

MARCH 21

Institution of Production Engineers

Sheffield graduate section: "Electronic Control Mechanism," by O. S. Puckle, 6.45 p.m., in the Devonshire Room, Grand Hotel, Sheffield.

Institute of British Foundrymen

East Anglian section: "My Hungarian Tour," by A. R. Parkes, 7.30 p.m., in the Lecture Hall, Public Library, Ipswich.

Beds. & Herts. section: (Details of change of programme may be obtained from the secretary.)

MARCH 22

National Society of Master Patternmakers

"An Introduction to Patternmaking in Plastics," by H. G. C. King, followed by dinner, 6 p.m., at the Metropole Hotel, Leeds.

Institution of Metallurgists

London section: Spring meeting: "The Expert Witness," by E. A. G. Liddiard, 6 for 7 p.m., at Battersea College of Technology, Battersea Park Road, S.W.11.

Institute of Fuel

Scottish section: Annual general meeting followed by "Electro Precipitators," by J. Martin and J. E. Sayers, 7 p.m., at the Royal College of Science and Technology, Glasgow.

MARCH 23

Institute of Fuel

Republic of Ireland group: "Drum and Pneumatic Drills," by H. Pollock, 8 p.m., at the Engineer's Hall, 35, Dowson Street, Dublin.

Institution of Production Engineers

Worcester section: "Design and Development of Machine-tools," by C. A. Sparkes, 7 p.m., at the Star Hotel, Worcester.

Institute of British Foundrymen

Southampton section: "Patternmaking in Plastics," by H. G. C. King, 7.30 p.m., at the Technical College, St. Mary's Street.

London branch: "Review of the Work of the IBF Technical Council on the Effect of Cooling Rate on the Properties of Grey-iron Castings," by M. M. Hallett, M.Sc., F.I.M., 7.30 p.m., at the Constitutional Club, Northumberland Avenue, W.C.2.

Birmingham branch: "Metallurgy of Welding Cast Irons," by D. R. Thorneycroft, 7.15 p.m., at the James Watt Memorial Institute, Great Charles Street.

MARCH 24

Institute of Fuel

East Midland section: "First Principles of Work-study," by J. McLean, 6.30 p.m., at the Electricity Showrooms Lecture Theatre, Nottingham.

Midland section: "Waste-heat Recovery," by G. H. Steward, 6.30 p.m., at John Thompson Lecture Hall, Ettingsall, Wolverhampton.

Institution of Production Engineers

Rochester graduate section: "Recovery of Industrial Waste Material," by W. H. Bickle, 7.30 p.m., at Old Palace, Maidstone, Kent.

Institute of Metals

Sheffield local section: "Molybdenum," by L. Northcott, 7.30 p.m., in the Applied Science Building of the University, St. George's Square.

Combustion Engineering Association

Western region: One-day meeting at th Seabank Hotel, Porthcawl (Glam). 10.30 for 11 a.m.: "Modern Industrial Water Treatment," by G. Ferencz: 2.15 p.m., "Training of Boiler-house Operatives," by a member of the National Industrial Fuel Efficiency Service.

Institute of British Foundrymen

Wales and Monmouth branch: Film Evening, 7 p.m., at the Engineers' Institute, Cardiff.

MARCH 25

Institute of British Foundrymen

West Wales section: "Gating and Feeding of Heavy Steel Castings," by A. P. Riley, 7 p.m., at Richard Thomas & Baldwins, Limited, Landore, Swansea.

Tees-side branch: "Any Questions," with guest panel, 7.30 p.m., in the Teesdale Hall, Head Wrightson & Company, Limited, Thornaby-on-Tees.

Manchester Association of Engineers

"Design and Erection of the Atomium," by F. Hebrant, 6.45 p.m., at the Engineers' Club, Albert Square, Manchester.

MARCH 26

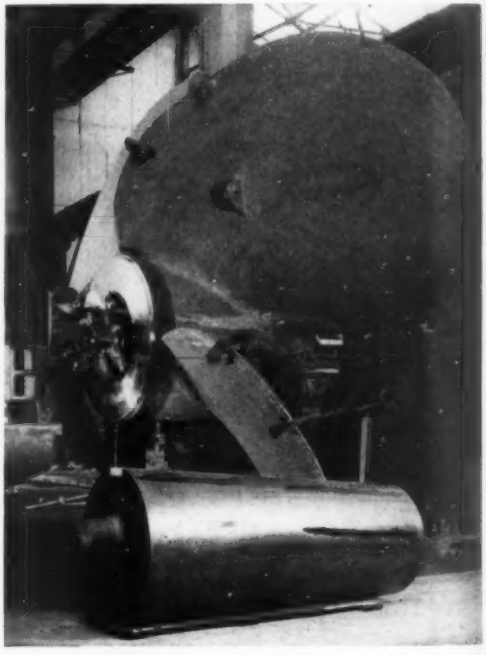
Institute of British Foundrymen

Newcastle branch: Visit to Jarrow Metal Industries, Limited, Western Road, Jarrow. (Details from secretary).

Propellers for P. & O. Canberra

The illustration shows one of a pair of "Heliston"-design propellers, in high-tensile Novoston material—to be held in reserve for the new twin-screw 45,000-ton P. & O. liner Canberra—being manufactured in the Glasgow works of Bull's Metal & Marine, Limited. The propeller is seen in the process of being taper-bored for fitting to the tail-shaft. In the foreground is the plug-gauge, providing in effect a facsimile of the shaft, to ensure that the propeller will be a perfect fit. Note the lifting lugs on the propeller for ease of manipulation during the manufacturing operations. These lugs, of course, are removed when the grinding and polishing of the blades is completed and the propeller is made ready for balancing.

Each propeller when completed will weigh approximately 29 tons although some 40 tons of "Novoston" bronze was actually used for the casting. These four-bladed propellers have been designed for a maximum of 42,500-h.p. per shaft. Only under certain conditions however, will it be necessary to make use of the full power; nevertheless the service speed of this remarkable 740-ft. long, 45,000-ton Canberra will be 27½ knots.



Making a 37-ton Lathe-headstock Casting

*By A. Ross, M.I.B.F., and C. Warburton, Assoc. M.C.T.**

Castings like the one described in this article are not uncommon to manufacturers of heavy machine-tools, although most of them are of the "one-off" variety. In order to overcome the many problems associated with their production the fullest co-operation between designer, patternmaker and foundryman is essential. In what follows, the method used for the production in iron of a headstock casting for a "Craven" 86½-in. centres unit-construction lathe is outlined.

It was estimated that a lathe-headstock casting required at the foundry of Craven Bros. (Manchester), Limited, would weigh approximately 36 tons, and have the following overall dimensions: 10 ft. 7 in. long by 14 ft. wide by 7 ft. 3 in. high.

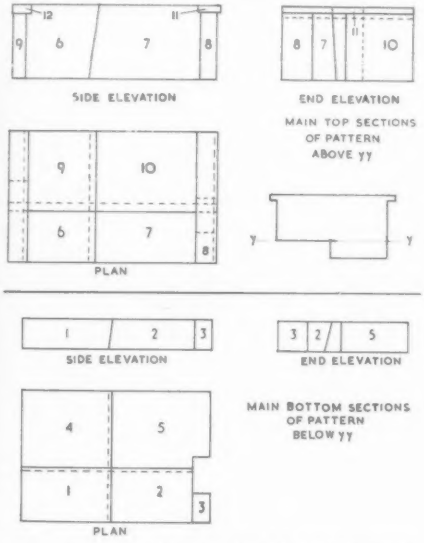


FIG. 1.—*Drawings showing the 12-piece pattern for the lathe-headstock casting produced by Craven Bros. (Manchester), Limited.*

No suitable pattern was in existence. The drawings were very carefully studied and it was decided that a sectional pattern of 12 main pieces should be made (see Fig. 1). All these pieces had a one in five taper on one or two sides to facilitate easy withdrawal from the mould, and to eliminate "underramming." Added advantages with this method of construction are that the handling, transportation and storage problems are reduced, and, should a similar headstock be required at a future date, any of these sections could be utilized again.

At this stage, the exact method of mould and core construction and the method of assembling and securing the cores was decided upon, as was the method of running and feeding. The coreboxes were also constructed in sections to facilitate handling, drying and final assembly. Each corebox was designed to produce a core that could be assembled in the mould from the stripped position. This procedure was adopted to give a core of greater dimensional stability. The runner system is shown in Fig. 2.

Preparation of the Pit

In order to withstand the ferrostatic pressure involved, the base of the pit and the sides to a height of 4 ft. were reinforced with cast-iron plates. The base was constructed with two cast-iron universal plates 16 ft. by 8 ft. by 7 in. thick, and the sides with cast-iron plates 4 ft. square by 1½ in. thick. Two bars, 4½ in. dia. by 15 ft. 6 in. long, were positioned across the universal plates, one bar along the centre line of the main spindle-bearing cores, and the other across the centre of the main gear-box cores. The purpose of these bars was to secure staples (four to each bar), which were subsequently used for bolting down the cores. Here it should be mentioned that the staples were surrounded by cast-iron sleeves which reached from the top of the tie-bars to below the layer of brickwork. These sleeves were filled with cinders prior to coring up.

Making the Bed

The preparation of the bed was of paramount importance, and due to the design of the headstock two bed levels were necessary. However, since both these beds were prepared in the same manner, the detailed description which follows refers to the lower-level bed to the right of the line XX in Fig. 3.

A well-rammed layer of cinders approximately 4 in. thick was laid over the universal plates. This was covered by a well-rammed layer of backing sand 12 in. thick; levels were then obtained. A single course of common brick was laid over the whole area, the width of the gap between each brick being half an inch. These bricks were clay

* Mr. A. Ross is the foundry manager, and Mr. C. Warburton the chief metallurgist, at Craven Bros. (Manchester), Limited.

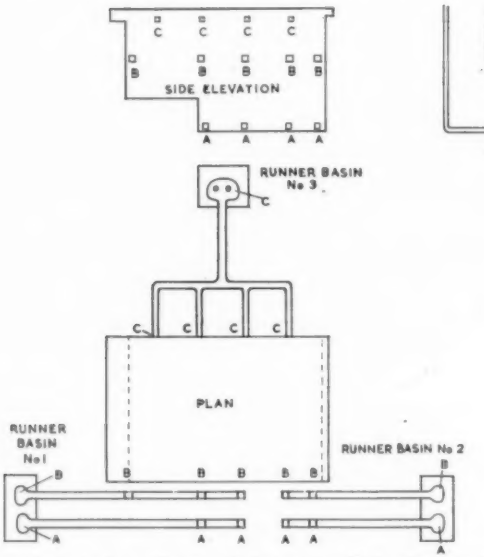


FIG. 2.—*Diagram of the layout of the runner system used when pouring the 37-ton lathe-headstock casting and, below, table of sizes employed.*

Runner basin number	Number off.	Description.	Size (in.).	Total area (sq. in.).
1	1	Sprue A	3.5 dia.	9.6
	1	Cross runner ..	4 by 2	8.0
	2	Downgates ..	3 by 1.25	7.5
	2	Ingates	3 by 1	6.0
	1	Sprue B	3.75 dia.	11.0
	1	Cross runner ..	4 by 2.5	10.0
	3	Downgates ..	3 by 1	9.0
	3	Ingates	2.75 by 1	8.25
2	1	Sprue A	3.5 dia.	9.6
	1	Cross runner ..	4 by 2	8.0
	2	Downgates ..	3 by 1.25	7.5
	2	Ingates	3 by 1	6.0
	1	Sprue B	3.5 dia.	9.6
	1	Cross runner ..	4 by 2	8.0
	2	Downgates ..	3 by 1.25	7.5
	2	Ingates	3 by 1	6.0
3	2	Sprue C	3.75 dia.	22.0
	1	Cross runner ..	5 by 4.5	22.5
	4	Downgates ..	3 by 1.75	21.0
	4	Ingates	5 by 1	20.0

washed and a slurry of loam applied, the final thickness of the loam coating being 1¼ in. Two portable gas-dryers were placed in position and the bed skin dried; after removal of the dryers, the bottom sections of the pattern were set and the true shape of the bed then completed in loam. The bottom sections of the pattern were removed, and stud blocks to support the main body cores and vent holes for the main spindle-bearing and "tank" cores prepared. To assist in the final drying process the bed was then dried for a further 24 hours. On both occasions the pit was covered with thin plating carried on bearer bars.

Mould Preparation

The bottom sections of the pattern were replaced and the four bottom ingates (A, Fig. 2) placed in position. A 27-in. thick wall of loam-faced common bricks was built up around the bottom sections of the pattern up to the height of the second bed level. The second bed level was then prepared, and the remaining sections of the pattern set in position; the five ingates (B, Fig. 2) were then positioned. A further two courses of loam-faced bricks 27-in. thick were added to the existing wall, which was now extended around the perimeter of the gear-box section of the headstock, *i.e.*, to the left of the line XX in Fig. 3, to a height of 7 in. The remainder of the pattern was rammed up to the joint face in the normal way, in addition to the usual reinforcing irons. The four corners were reinforced with 6 by 6-in. angle irons set in the 27-in. thick brickwork, five inches behind the mould face. During the final ramming, the four remaining ingates (C, Fig. 2) were positioned nine in. below the joint face and corresponding to the four internal walls of metal.

Top part

The top part of the mould was made in two halves prepared in the usual way. The positions of the runners, risers and vents were marked on top of the pattern and the top part rammed up. The top parts were then removed and the pattern withdrawn.

Finishing

After withdrawal of the pattern, the mould was patched where necessary and "face sprigging" carried out. Here again particular attention was

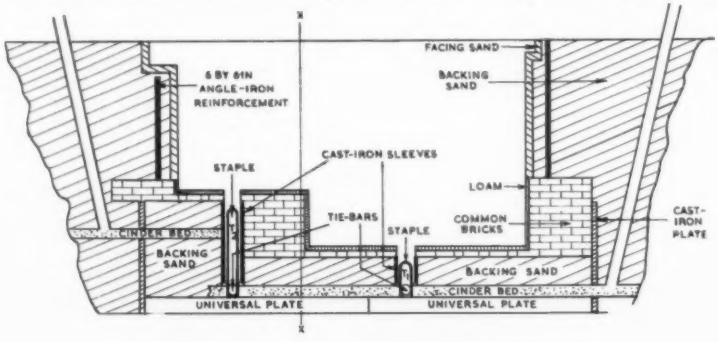


FIG. 3.—*Section view of the mould and bed, in which it was necessary to work from two levels.*

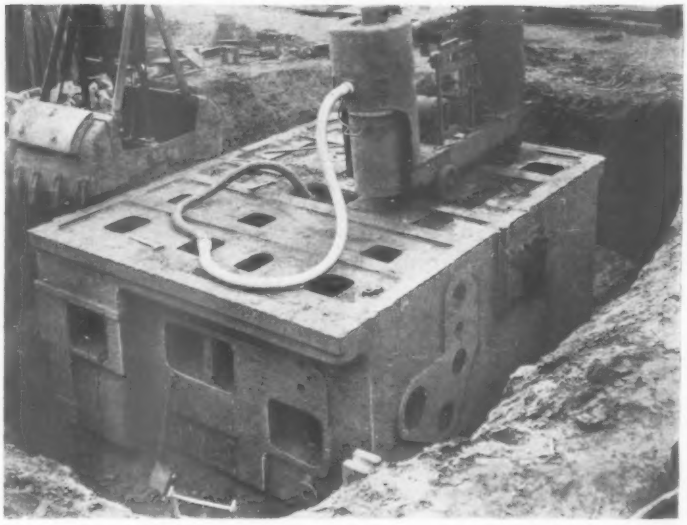


FIG. 4.—*Stage in the knocking-out of the lathe-headstock casting. The portable equipment on top of the casting is an industrial vacuum cleaner (made by British Vacuum Company, Limited), used for lifting sand from the top cores to minimize dust when turning the casting over. The nozzle of the cleaner was removed, and the 4-in. suction pipe, which is normally coupled to mains, was quite effective for removing the bulk of the sand.*

paid to the corners and ingate areas. The mould was painted with blacking and two portable gas-dryers applied for 76 hours. After the dryers had been removed, the mould was inspected and found to be suitable for the coring-up operation to commence.

Coring Up

All the cores were produced in oil-sand using a semi-solid binder. Several accurately-marked staffs were supplied by the patternshop to enable the cores to be set correctly. The two main spindle-bearing cores and the "tank" core which sits between them were the first to be located, since all the other cores must be set relative to them. These three cores were secured to the staples on the tie-bar (T.1, Fig. 3) with hook-bolts, one hook-bolt being used for each main spindle-bearing core and two for the "tank" core which ultimately forms the oil reservoir. The gear-box section was comprised of four main cores, but these were sub-divided into eight. This enabled the four bottom halves to be secured to the staples on the tie-bar (T.2, Fig. 3), and allowed the main drive-shaft cores to be accurately set. The remaining four halves were then positioned and fastened with hook-bolts to their respective half. All the remaining cores were placed in position and secured with chaplets and studs. Gas-dryers were then placed in position, and the assembled mould dried for a further 12 hours before closing.

Closing the Mould

The top parts were "tried on": vents, runners, risers and the mould were then thoroughly inspected prior to the final closing. Here it should be mentioned that all the vents in the top part were piped. The three runner-basins were then positioned, all the joints carefully sealed and approximately 200 tons of weights applied.

Pouring

The metal was collected in three ladles, of 18, 16- and 8-ton capacity respectively. The 18 and the 16-ton ladles were positioned on Nos. 1 and 2 runner-basins, and the 8-ton on runner basin No. 3 (see Fig. 2). Pouring from the 18 and 16-ton ladles commenced simultaneously, and when the

FIG. 5.—*The hole, three-ft. wide, which was dug around the casting to facilitate cleaning operations* in situ, *was afterwards extended a further eight ft., to permit the casting to be raised on end.*

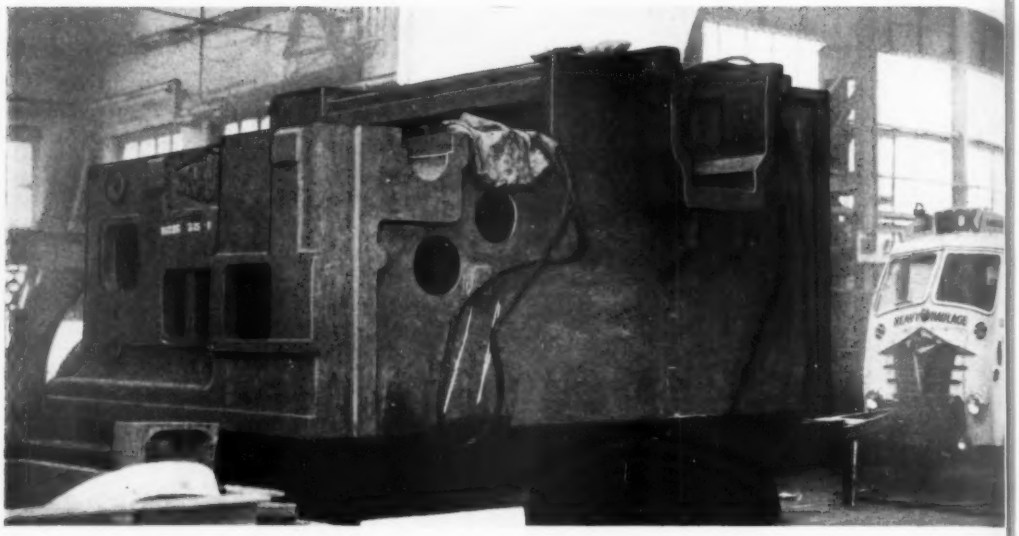


FIG. 6.—*The 37-ton headstock casting being transported to the machine-shops for final finishing operations.*

runner-basins were two thirds full one "stopper" was lifted in each, these stoppers being the ones connected to the bottom ingates (A, Fig. 2). Forty seconds after lifting the first two "stoppers," the second "stoppers" in the runner-basins Nos. 1 and 2 were lifted, thus allowing metal to flow to the intermediate ingates (B, Fig. 2). Commencement of pouring from the 8-ton ladle was delayed until the 18 and 16-ton ladles were almost empty. The total casting time was 210 seconds. Approximately 64 hours after casting, the top parts were removed and the runners and risers broken; the top of the casting was then covered by a thick layer of sand and the casting allowed to cool for ten days.

Metal Composition

The percentage chemical composition of the iron used was: T.C. 3.33; Si 1.88; Mn 0.72; P 0.65; S 0.066, and Fe bal.

De-coring and Fettling

Due to the large unfettled weight of the casting and cores, it was decided that complete de-coring and fettling should be carried out *in situ*. To enable this to be done, a hole one yard wide was dug around the casting and the normal cleaning operations commenced (see Fig. 4). At a later stage, one end of the hole was extended a further 8 ft. to enable the casting to be stood on end (see Fig. 5). In this position the final cores were removed. Fig. 6 shows the casting (black weight 37 tons) being transported to the machine-shops.

Railway Wagon Company Merger?

An offer, which involves an exchange of ordinary stocks into a new holding company and which could form the basis for a merger has been made by Charles Roberts & Company, Limited, makers of road and rail vehicles, axles, springs, etc., of Horbury Junction, near Wakefield, to the Birmingham Railway Carriage & Wagon Company, Limited. The two companies are among Britain's largest railway-carriage and wagon makers.

The new holding company's ordinary capital would be in 5s. units and the proposed exchange basis would be three units for each £1 in the Birmingham company's £990,975 capital, and one for each 5s. unit in Charles Roberts's £1,398,150 ordinary.

The board of Birmingham Railway Carriage & Wagon states that it has considered the offer, but feels that before it is justified in making any recommendation it should obtain an up-to-date valuation of assets. The necessary steps are being taken.

EMI withdraws Bid

The bid made by Electric & Musical Industries, Limited, for Henry Simon (Holdings), Limited, was withdrawn last week. The decision by EMI was taken after it learned that the board of Henry Simon (Holdings) and Simon-Carves, Limited, had agreed to recommend the complete merger of their two businesses, which are the parents of a number of engineering companies known as the Simon Engineering Group.

The exact terms of the merger must await the final results, available to the directors by the end of the month. However, a new holding company will be created, inter-company shareholdings will be eliminated, cash surplus to the requirements of the new group will be withdrawn for the benefit of shareholders, and a more liberal dividend policy will be adopted.

Merger discussions were going on several days before the EMI proposal was issued at the beginning of the month. EMI bid one 10s. share and 5s. in cash for every Henry Simon (Holdings) 5s. share.

Gas in Gunmetal

By A. D. Sarkar, B.Sc., B.Eng.

In assessing the results of various researches, the author concludes that harmful gases may be excluded from gunmetals by the application of suitable melting techniques. The melting of an alloy under an oxidizing atmosphere, followed by deoxidizing, gives better mechanical properties than melting it under reducing conditions. Scavenging gas-treatment is an alternative to this technique for gunmetals containing substantial proportions of elements with a high affinity for oxygen.

Control of the amount or type of dissolved gas in gunmetals necessitates the employment of various melting atmospheres, *i.e.*, neutral, oxidizing and reducing. Gas-free melts may also be successfully produced by a scavenging gas-treatment in which the atmosphere is not necessarily controlled. In this, prior to casting, any dissolved gas is expelled by bubbling an inert gas, such as nitrogen, through the melt under a predetermined pressure for a definite length of time. Whilst the attainment of a neutral atmosphere is very near an impossible commercial proposition, an oxidizing or reducing atmosphere may be achieved without much difficulty. Daniels[1] obtained material of higher density by melting 88/10/2 gunmetal under an oxidizing atmosphere, in contrast to reducing conditions—the influence of atmosphere on pure-copper melts was not pronounced. He suggests that Allen's[2] theory on steam reaction, as applied to copper, can be extended to Cu/Sn/Zn alloys if cognizance is given to the fact that the reduction of Cu_2O formed by the steam reaction:

$$2Cu + H_2O \rightleftharpoons H_2 + Cu_2O$$

would take place by zinc and tin as follows:

$$2Cu_2O + Sn \rightleftharpoons SnO_2 + 4Cu$$

and

$$Cu_2O + Zn \rightleftharpoons ZnO + 2Cu$$

Comparison of the density figures suggests that tin does not reduce Cu_2O as efficiently as zinc.

Oxidation/Reduction

Baker and Child[3] assessed the suitability of an oxidation/reduction technique, *i.e.*, melting under an oxidizing atmosphere and deoxidizing the metal subsequently, for the commercial gunmetals. Oxidizing with 0.1-per cent. oxygen and then deoxidizing with phosphorus gave metals with superior densities. Oxygen below that amount did not have a marked effect in lowering porosity. With Cu/Sn/Zn alloys, oxidation for five minutes and then deoxidation with zinc was quite effective with a low zinc content (0.5 per cent.). For alloys with a higher zinc content, zinc by itself did not appear to be a very effective deoxidant. Very low density-values were noted for Cu/Sn/Zn/Pb alloys when melted under a reducing atmosphere.

Flux

Baker *et al* used equal proportions of cupric oxide and potassium nitrate as the oxidizing flux. Manganese ore at the bottom of the melting crucible proved to be a good scavenger. However, if mixed with the CuO and KNO_3, manganese ore became ineffective. The efficacy of various fluxes and deoxidizers for bronzes was investigated by Pell-Walpole[4] exhaustively, and he specifies the following requirements for a flux:

(*a*) The oxide must be unstable at operating temperatures; it must be that of a parent metal in the alloy, so that in case of reduction, contamination of the melt would not occur.

(*b*) The flux must be able to dissolve any oxide skin that may exist in the melt.

(*c*) The flux must be of such consistency as to spread over the molten bath during the process of melting; it must have sufficient fluidity to permit thorough mixing between metal and flux—an important operation which is carried out by agitating to dissolve any adventitious oxide-particles within the melt.

(*d*) Some thickener must be added, so that removal of flux at the appropriate stage is facilitated.

(*e*) The flux must not corrode the crucibles or any other melt container; it must be cheap, easy to handle and prepare, and free from objectionable fumes.

Research Work

To ascertain the suitability of various fluxes, various proportions of sodium chloride, sodium fluoride, boric acid, glass, fused borax and dried red-sand were added to copper oxide. The use of pure cupric oxide in the initial work did not appear to have any advantage over the use of copper mill-scale, so the latter was used in all the subsequent experiments. Excessive fuming resulted from using a flux of equal parts of CuO, NaCl, NaF and boric acid at the rate of 1 oz. of flux to each lb. of metal, and deoxidizing with 0.05-per cent. phosphorus or 0.1-per cent. aluminium. There was a slight attack on the crucible, and thickening was difficult—nevertheless, excellent degassing action was noted. Ordinary dried flux gave rise to water-vapour at the fusion point—the use of prefused flux was thus very desirable. Bone-ash when used as a thickener caused gassy melts, when applied in the uncalcined condition. A high proportion of cupric oxide led to a high tin-loss. The Sn/CuO behaviour is expressed as follows:

$$2CuO + Sn \rightleftharpoons SnO_2 + 2Cu$$

Gas in Gunmetal

Part of the tin oxide is retained in the melt, which is a contributing factor in lowering the solubility of hydrogen in the metal. The rest migrates into the dross, and represents the actual tin loss. The SnO_2 dissolved in the metal is reduced by phosphorus subsequently, necessitating the addition of an excess of the deoxidant.

Melting Procedure

The following melting instructions gave ideal results: (1) Melt under a pre-fused flux, using 1 oz. of flux per lb. of metal; (2) when molten, skim the flux to one side; add one half of the deoxidant, *viz.*, one half of 0.05 P or 0.1-per cent. Al respectively; (3) dissolve the tin; (4) superheat to the desired temperature for 10 to 15 min.; (5) by stirring, mix flux and melt together; (6) allow time for the flux to float to the top again; (7) wait for thickening; (8) skim off flux completely; (9) deoxidize with the rest of the deoxidant; (10) cool to pouring temperature, and (11) pour. Melting under oxidizing conditions gave the best results. Flux composition, type of deoxidizer, and factors such as type of thickener and time of contact between flux and metal, all influenced the final quality of the metal. The most suitable flux for tin/bronze was found to be: borax 30, sand 50, and cupric oxide 20 per cent. by weight. A thickener of three parts sand to one part borax, or three parts sand to one part sodium fluoride, was found to be the most effective. Aluminium proved to be a more powerful deoxidant than phosphorus. However, bronzes deoxidized with aluminium had inferior mechanical properties, due to entrapped aluminium oxide. Baker and Child found that cupric oxide alone did not have sufficient fluidity, and CuO and KNO_3 in equal proportions gave the desired consistency.

Deoxidation

The Oxidation/Reduction technique involves (*a*) melting under an oxidizing flux, to preclude the entry of hydrogen into the metal, and (*b*) removing, prior to casting, any dissolved oxygen by adding a deoxidant. The most commonly employed deoxidizer for gunmetals is phosphorus. Michael, Ruddle and Cibula[5] have investigated the Cu/O/P system, the principles of their deductions being briefly outlined in what follows and the reactions expressed as:

$$2xCu + 2yP + (x+5y)\underline{O} = xCu_2O \,.\, yP_2O_5^{*}$$

where x and y are constants.

From this equation:

$$K_6 = \frac{^{a}(xCu_2O \,.\, yP_2O_5)}{a_{Cu}^{2x} \,.\, a_{P}^{2y} \,.\, a_{O}^{(x+5y)}}$$

where a( ) denotes the activity of the respective element or compound. The term a_{Cu}^{2x} is unity. If the slag composition is constant the term $^{a}(xCu_2O \,.\, yP_2O_5)$ can be omitted. Also, since very low dilutions were involved, the activities of phos. and oxygen can be expressed as their molecular fractions $[P]^{2y}$ and $[O]^{x+5y}$ respectively, so that the new equilibrium constant becomes:

$$K_7 = \frac{1}{[P]^{2y} \,.\, [O]^{(x+5y)}}$$

$$i.e.\ [P]\,[O]^{\frac{(x+5y)}{2y}} = \text{constant}$$

Thus, the residual phosphorus in the alloy must be proportioned in accordance with the oxygen present in the melt. If the oxygen content of the metal were in excess of the equilibrium value, the phosphate slag would separate in the molten state and would persist during solidification, in which case it would be trapped in the casting. If an inadequate deoxidizer were used, oxygen in the presence of hydrogen would promote unsoundness as a result of steam reaction. It is believed that presence of hydrogen increases the critical value of the residual phosphorus to be added to the melt by about 0.002 per cent.

Scavenging Gas-treatment

Baker and Child, in their study of the usual commercial gunmetals, exposed melts to nitrogen for 20 to 30 min. with good results. Only five-minutes' treatment was necessary when nitrogen was bubbled through the melt. Maximum soundness was obtained when a rapid stream of nitrogen was bubbled through the melt at the rate of 500 to 600 litres per hour. The underlying principles of the scavenging gas-treatment, to get melts free from deleterious gases, are mainly twofold. First, since the solubility of a gas in metal depends on its partial pressure above the melt, the gas in question can be precluded if some other gas envelops the furnace atmosphere—the suitability of a nitrogen atmosphere is due to its characteristic inertness to gunmetals. Secondly, where nitrogen is bubbled through the melt—the method largely employed in industry—the principle of diffusion is embodied. If hydrogen is to be removed, it must be able to diffuse towards the N_2/metal interface. Clearly, the larger the area exposed, the better will be the degassing efficiency. The desirability of bubbling nitrogen has been demonstrated by Baker and Child. If an impermeable oxide forms on top of a melt, degassing is impeded, so it is usual to use a flux in conjunction with the scavenging gas. The application of the oxidation/reduction technique is difficult with gunmetals having large proportions of elements possessing a high affinity for oxygen, *e.g.*, Zn, P, Al, Mn, Mg, etc. Scavenging gas-treatment could be a suitable alternative in such cases.

REFERENCES

1. E. J. Daniels, *Journal* Inst. of Metals, 1930, **43**, 125.
2. N. P. Allen, *ibid.*, 1932, **49**, 317.
3. W. A. Baker and F. C. Child, *ibid.*, 1944, **70**, 349.
4. W. T. Pell-Walpole, *ibid.*, 1944, **70**, 127.
5. A. D. Michael, R. W. Ruddle and A. Cibula, *ibid.*, 1957, **85**, 506.

* In the metal phase.

FIRST EXPORT ORDER for the Dowlais foundry of the Guest Keen Iron & Steel Company, Limited, was for ingot moulds, worth about £80,000 for an American customer. Half the consignment was shipped at Cardiff last week, and the remainder will go in two or three weeks' time.

Ironfounding Health and Safety

Detailed Arrangements for CFA Conference to be held from April 6 to 8, at Norbreck Hydro, Blackpool.

Six years have passed since the Council of Ironfoundry Associations last held a safety conference, and in that time there has been extensive progress in many matters concerning the health and safety of workpeople in the ironfounding industry and, indeed, in the foundry industry as a whole. Throughout this period, the Safety Committee of the CFA has given unremitting attention to a wide range of subjects, and its work has produced much additional knowledge on many problems of health and accident prevention deeply affecting foundry managements and operators.

As this new decade opens, it was felt that this was a good time to take stock, to survey the ground gained and to discuss ways and means of solving the industry's remaining problems in this field. Hence, it was decided to hold an "Ironfounding Health and Safety Conference" in April of this year. The Conference is to be held at Norbreck Hydro, Blackpool (a hotel well-suited to such a function), from April 6 to 8 inclusive, and it is hoped that it will provide a forum at which all who are interested in the problems of health and safety in the foundry industry can get together and survey the situation on lines both broad and detailed. Following brief particulars printed in the February 25 issue of the JOURNAL, the full programme for the Conference is now available as follows:—

Programme

Wednesday, April 6

The Conference will be opened by the chairman of the CFA Health and Safety Committee, Mr. H. A. Bonney, F.C.I.S., managing director, Follsain-Wycliffe Foundries, Limited, at 5 p.m. Next, two papers will be presented; the first will be "Problems of Industrial Health and Safety," given by Mr. T. W. McCullough, O.B.E., HM Chief Inspector of Factories, and this will be followed by a paper on "Care and Maintenance of Grinding Wheels," by W. J. Cleverley, of the Carborundum Company, Limited. Dinner at 7.30 p.m. will be followed by the showing of an industrial safety film.

Thursday, April 7

The proceedings on the second day of the Conference will commence at 9.30 a.m. and during the morning, three papers will be presented under the general title of "The Cost of Dust." The first will be given by Dr. G. MacBain, D.S.C., L.M.S.S.A., D.I.H. (medical officer, Birmid Industries, Limited), on "An Introduction to Pneumoconiosis," and will be followed by "Incidence of Pneumoconiosis in Ironfoundries," by Dr. G. F. Keatinge, D.I.H., and "How to Control Dust," by Mr. W. B. Parkes (assistant development manager, British Cast Iron Research Association). There will be a break for coffee at 11 a.m. and luncheon will follow at 12.30 p.m.

The afternoon session will commence at 2.30 p.m. when Mr. E. E. Ward (safety officer, C. A. Parsons & Company, Limited) will present a paper on "Personal Protective Equipment in the Foundry," and Mr. M. M. Hallett (managing director, Chamberlin & Hill, Limited) will talk on "Accident Prevention in the Smaller Foundry." After a break for tea at 3.45 p.m., the final paper of the day entitled "First-aid in the Foundry" by Dr. R. N. Wilson, M.B., B.S., D.P.H. (medical officer, Stanton Ironworks Company, Limited) will be presented. From 5.30 to 7.30 p.m. discussions will take place on the papers presented and the day's proceedings conclude with dinner.

Friday, April 8

Friday's programme is to commence at 9 a.m., when a report will be given on points arising from the discussions. This will be followed by a paper entitled "Safe Lifting-gear in Foundries," by Mr. C. H. A. McCaully (technical director, W. & E. Moore, Limited). After a break for coffee, the final paper of the Conference will be given by Mr. W. H. Harris (accident-prevention officer, Boots Pure Drug Company, Limited), his subject being "What We Expect from Our Supervisors and Foremen." The final session is scheduled for 12.30 p.m., and the Conference will conclude with luncheon.

A foundry safety-equipment exhibition will remain open throughout the Conference.

The entrance fee for the Conference is £3 10s. and application forms may be obtained from the secretary, Council of Ironfoundry Associations, 14, Pall Mall, London, S.W.1. (Ample accommodation is available at the hotel for relatives and friends who may accompany delegates.) The closing date for receipt of applications to participate in the Conference will be March 25 or earlier if accommodation is taken up. Any persons wishing to stay over the weekend should note that the Norbreck Hydro is already heavily booked, but the hotel manager may be able to reserve alternative accommodation.

Bellfounding in Italy

The January issue of *La Fonderia Italiana* carries an interesting article on two bell foundries. It is the result of a questionnaire sent out by the well-known metallurgist, Dr. G. Somigli. From it, it appears that there are no fewer than 32 bell foundries in Italy and notes of the activities and history of two of them are printed. These are Colbachini Pietro of Bassano del Grappa and Marinelli Armando and Son of Agnone. Both are old-established, but in connection with the latter it would appear that the most beautiful bell in Italy—and in all the world, it is claimed—was cast at Agnone in the Papal foundry of Armando Marinelli & Son in the year 1300, since when a member of the Marinelli family has always been dedicated to this difficult art.

Electrical Equipment in the Home

An exhibition devoted exclusively to all aspects of electrical equipment for the home is now being organized by a newly-formed company, Electrical Fairs, Limited, 25, Museum Street, London, W.C.1, which is a subsidiary of Electrical Engineers (A.S.E.E.) Exhibition, Limited. The first show will be held at Alexandra Palace, London, from September 23 to October 1. The intention of the organizers and the exhibitors is to promote the safe and correct use of electrical equipment in the home.

Mr. T. COLLIER, general manager of the Kilmarnock factory of the Glacier Metal Company, Limited, has been appointed a director of the company.

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Notes from the Branches

Beds & Herts Section

Attendance of members and guests at the annual dinner of the Beds and Herts section of the London branch of the Institute of British Foundrymen was nearly a record. It was held at the Wilbury Hotel, near Letchworth, on March 4, with Mr. F. C. Baker, section president, in the chair. After an excellent meal (and the Loyal Toast), the president said how pleased he was to see so many friends and personal acquaintances amongst the gathering and went on to express his regret that his own chairman, Mr. W. T. Hobkirk, was indisposed and therefore unable to attend. At this juncture, Mr. Baker presented a past-president's badge to Mr. G. A. Smith for two years' service in that office.

The toast of "Our Visitors" was proposed by Mr. H. W. Keeble and Mr. C. H. Wilson, the national president of the Institute, responded. "The Beds & Herts section" was proposed by Mr. J. Bain, A.M.I.MECH.E., president of the London branch and (deputizing for Mr. Hobkirk) Mr. A. R. Parkes, London branch secretary, made acknowledgment on behalf of the hosts. He suggested that a message of good wishes might be sent to Mr. Hobkirk from the gathering and that the section secretary, Mr. W. Twaddle, should be warmly applauded for running the section's affairs so unobstrusively and yet so ably. The rest of the evening was given over to light entertainment, the whole proceedings being excellently compèred by Mr. L. A. S. Harbourne.

Newcastle-upon-Tyne

Mr. Charles H. Wilson (national president) and Mrs. Wilson were the guests of honour at the Newcastle-upon-Tyne branch dinner held at the County Hotel, Newcastle, on February 20. Mr. J. G. Dodds (branch president) presided.

In the course of a speech proposing the toast of the branch, Mr. Wilson referred to the fact that the Newcastle branch had an impressive record of active workers in the Institute's affairs, and had had no less than three national presidents. He went on to say that he had been interested to note in a recent visit to the Australian (Victoria) branch that in many ways their problems were the same as those of the home branches. With the question of training, for example, they were as much concerned as the branches in this country, and although their facilities were perhaps not so comprehensive as those available in the UK, they were doing their best to meet the needs of the future. The president then reiterated the comments he had made at the Stoke-on-Trent section dinner the previous evening on the general lack of quality in the apprentices who had entered for the recent national foundry apprentices' competition, and urged the need for the most careful thought to be given to the question of training in the future. Mr. Dodds suitably replied to the toast.

A very witty toast to the ladies was then proposed by Sir William Scott and evoked an equally witty reply from Mrs. Dodds. The evening concluded with an entertainment by Joseph Wells (baritone) accompanied by Charles Routledge.

Lancashire

At the March meeting of the Lancashire branch, held at the Midlands Hotel, Manchester, Mr. C. M. G. Wallwork, branch president, announced that in place of the lecture which was to have been given by Mr. Zehnder—who unfortunately was ill—four films on foundry subjects would be shown. Those chosen were the "Use of CO_2 Sand in the Foundry" produced by the Distillers Company, Limited; the Mond Nickel Company's film, "Applications and Developments of Permanent Magnets," "The Invisible Shield" (an American film depicting methods of air-purification using water and compressed air), and "Hazard" a film on accident prevention made by the British Iron and Steel Federation. Mr. Wallwork, in closing the meeting, commented upon the scarcity of foundry films and invited members to send details of any they might know of to the branch secretary. Finally he announced that the branch annual general meeting and election of officers would be held on April 30.

Scottish

To mark the 50th anniversary of its formation, the Scottish branch has invited the General Council of the Institute to hold its Spring meeting in Glasgow. The Council has accepted the invitation and as a further recognition of the event, the Lord Provost and magistrates of the City of Glasgow have invited all Council members, and members of the Scottish branch and their ladies to a civic reception in the City Chambers on the evening of Friday, April 22. The branch will be hosts to members of Council and their ladies at a dinner at the Central Hotel, Glasgow, on April 23.

FTE & SA Members and Guests at Dinner:

On the facing page, the cameraman catches the informal atmosphere pervading the annual dinner of the Foundry Trades' Equipment and Supplies Association held earlier this month at the Connaught Rooms in London. Picture number one was taken at the top table and shows, from left to right, Mr. J. Bain, A.M.I.MECH.E. *(president, IBF London branch); Mr. R. Barber,* A.C.I.S. *(secretary, British Steel Founders' Association); Mr. C. Orton Foster (past-president, FTE & SA); Mr. E. C. Rowen (vice-president, National Society of Master Patternmakers); Mr. V. C. Faulkner,* F.R.S.A.*; Mr. M. J. Glenny, (chairman, Council of Ironfoundry Associations); Mr. John Rodgers,* M.P. *(Parliamentary Secretary to the Board of Trade), and Mr. Gavin C. Paterson (president, FTE & SA). In the second picture, on Mr. Paterson's right are Mr. C. H. Wilson (IBF national president); Mr. W. E. Aske (past-president, FTE & SA); Dr. C. J. Dadswell (chairman, BSFA), and Mr. W. Rawlinson (past-president, FTE & SA). In the third picture (inset), Mr. Rodgers is shown decorating the president (Mr. G. C. Paterson) with the emblem and ribbon of office. Mr. Paterson, Mr. Rodgers and Mr. Aske are seen chatting informally in photo number four; in number five, Mr. R. B. Templeton,* M.I.MECH.E., *(past-president, IBF) is in close converse with Mr. A. Talbot (past-president, IBF London), and Mr. Glenny. Photograph number six shows an informal group of members and guests, and number seven, a close-up of Mr. Orton Foster and Mr. Rowen at the dinner table. (Details of the function were printed in last week's* JOURNAL).

American Letter

Corebox Rigging for "High Production"*

In the writer's opinion, a high production rate is reached only when one man can operate an interchangeable coreblowing machine at a rate of at least 160 blows per hour while making an average-size core. (Only oil-sand, blow-type, steel-faced, magnesium coreboxes were considered in the original Paper.) Special set-ups for increased production are described in what follows.

Standardization

At the author's firm, the corebox is made in two pieces, (*a*) the main body, which contains the core cavity, and (*b*) the top magnesium plate, which is used to hold the blow tubes (see Fig. 1). The top plate also contains the upper-half corebox mounting-holes. Interchangeability is most important in a "high-production" core-room, especially where various kinds of cores are required in large numbers. All the machines should have the same dimensional characteristics, as well as identical corebox-guiding, locating and holding systems. With such equipment, one group of coreboxes can be removed and another set up to make an entirely different core within the space of a half-hour lunch period. The machines and coreboxes at the author's firm have been standardized, so that the only work required is the fastening of the upper-half blow-plate assembly to the sand reservoir, and the adjustment of the end stops and draw mechanism.

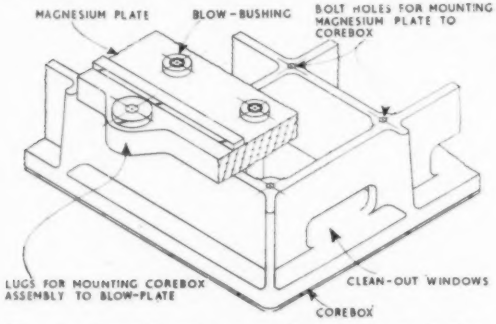


FIG. 1.—*Special corebox used at the author's firm.*

Corebox "Windows"

It is very important to have coreboxes that can be used hour after hour without trouble. A properly-screened corebox, with a liberal number of well-placed blow-holes, must also include certain other features to maintain a high rate of production. For example, sand fines will escape through vent screens and lodge in the screen passages, and eventually plug the passages. To overcome this at the author's firm, windows have been cast in the sides of the upper-half coreboxes (see Fig. 1). An air-hose nozzle can be inserted in these windows to blow the screen passages clean. It was found that coreboxes without these cast windows had to be removed from the machine for cleaning after four hours' use, while boxes with windows could be used steadily for 16 hours.

Shear-bushing Assembly

The corebox pin can also create problems. If a machine functions out of cycle, and starts to close before proper centring has taken place, the corebox pin ear will be broken. To prevent such damage, a shear-bushing assembly has been developed (see Fig. 2). First, a steel-flanged-type bushing is installed, next a brass bushing with a small flange and shoulder, and finally the corebox pin. With this arrangement, if a machine operates out of cycle, the only damage done, in most cases, is to the brass bushing, which can be replaced in a short time while the corebox is still on the machine. This set-up has greatly reduced repair time and costs.

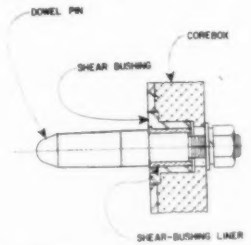


FIG. 2.—*Shear-bushing assembly of unusual design, developed to avoid damage to the corebox pin ear in the event of a machine functioning out of cycle.*

Blowtube

With regard to blowtubes, the most trouble-free and long-lasting type, in the author's opinion, is that shown in Fig. 3. This assembly consists of three parts: the blow bushing itself, the blow-bushing liner and the blow-bushing insert. The bushing is made of cold-rolled steel, and turned with a 0.25-in. thick flanger—its inside diameter is made to accept the liner (slip fit) and the insert (press fit). A plain piece of standard stainless-steel tubing, ground on the outside diameter,

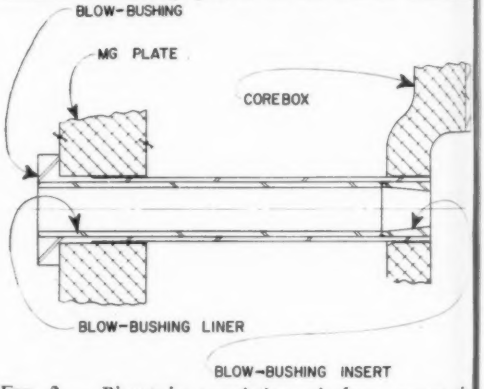


FIG. 3.— *Blowtube consisting of three parts: the cold-rolled steel blow bushing; stainless-steel blow-bushing liner, and blow-bushing insert.*

is used for the blow-bushing liner, which is held in place by melting a small amount of solder between the liner and the blow bushing. Stainless-steel is used because of its durability. The insert is pressed into the bottom of the blow bushing. The back angle of the inside of the blow bushing is used to separate the sand within the blowtube from the blown core during the draw operation.

Change-pieces, and Venting

Continuous blowing of sand under pressure can cut a corebox in a short time. This should be borne in mind when designing a corebox for production use, and steel or copper change-pieces should be incor-

* Abstracted from a paper by W. H. Miller, who is supervisor of pattern process and design at the Ford foundry in Cleveland, Ohio.

porated. This will greatly reduce the amount of time taken for repairs. Although corebox venting is generally done by installing vent screens, an alternative method worth considering is that of venting by clearance around the corebox insert pieces. For example, when inserting a barrel in a cylinder-block water-jacket corebox, the insert can be made about 0.015 in. smaller in diameter than the corebox. Then, by drilling a series of small holes in the corebox beneath the insert piece, a type of vent is created.

ISI Translations

The Iron and Steel Institute has been notified that the following translations are available from other sources, and for these enquiries should be sent to the organization denoted by the initials SLA, etc.: for addresses see end of list.

SLA 59-20909 "New Process for the Production of Dense Castings in Non-ferrous Metals." Anon. *Giessereipraxis*, 1936, vol. 57, pp. 313-14. Mi. $1.80, ph. $1.80.

LC SLA 59-20079 "Gas-heating of the Shrinkage Head of an Ingot." Konovalov, K. N., N. K. Korneva, *et al. Stal'*, 1958, vol. 18, No. 4, pp. 311-16. Mi. $2.40, ph. $3.30.

SLA 59-20930 "Desiliconization and Desulphurization of Cast Iron by Means of a Single Slag." Perrin, R. *Comptes Rendus* (France), 1954, vol. 239, No. 17, pp. 1042-43. Mi. $1.80, ph. $1.80.

SLA 59-20438 "Impact Strength and Notch Sensitivity of Cast Iron." Piwowarsky, E. *Giesserei* (Germany), 1936, vol. 23, No. 26, pp. 674-85. Mi. $2.70, ph. $4.80.

SLA 59-20439 "Present Status of the Superheating of Melts of Cast Iron." Piwowarsky, E. *Giesserei* (Germany), 1937, vol. 24, No. 21, pp. 510-18. Mi. $2.40, ph. $3.30.

BCIRA 941 "Types of Fractures in Castings and Conditions for Their Formation." Pribyl, J. *Slevarenstvi*, 1956, vol. 4, No. 6, pp. 185-91.

SLA 59-20378 "Progress in the Field of High Frequency Induction Heating." Russ, E. *ETZ* (Germany), 1923, vol. 44, No. 21, pp. 481-84. Mi. $2.40, ph. $3.30.

SLA 59-20900 "Metal Spraying and Its Use for the Production of Wear-resistant Coatings." Schenk, G. *Maschinenschaden* (Germany), 1939, vol. 16, No. 5, pp. 69-75.

Symbols for sources of translations:—

SLA: SLA Translation Centre, John Crerar Library, 86, East Randolph Street, Chicago 1, Illinois, USA. LC: Photoduplication Service, Library of Congress, Washington, 25, D.C., USA. BCIRA: British Cast Iron Research Association, Bordesley Hall, Alvechurch, Birmingham.

The following translation is now being prepared by Mr. H. Brutcher, P.O. Box 157, Altadena, California, USA.

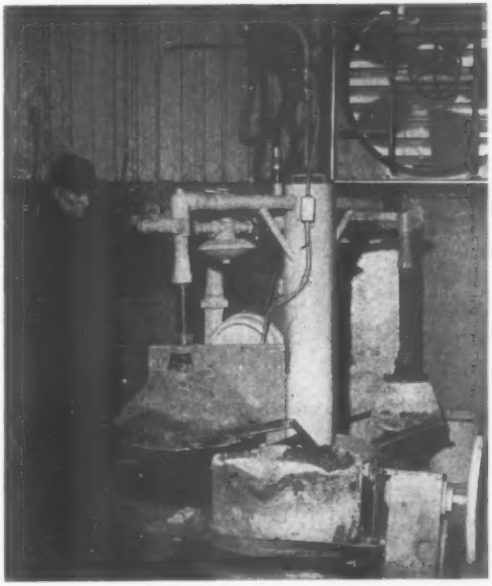
HB "Investigations of Heat-transfer in Continuous Casting Moulds." Akimenko, A. D. *Izvest. Vysshikh Ucheb. Zav. Ch. Met.*, 1958, (12).

UK Displays at German Hardware Fair

The Board of Trade has organized two collective displays of British products with the collaboration of the British Electrical and Allied Manufacturers' Association (BEAMA) and the Vitreous Enamel Development Council (VEDC) at the International Household Goods and Hardware Fair which opened in Cologne last Friday. Four of Britain's biggest producers of vitreous-enamelled hollow-ware are staging individual displays on a stand covering 450 sq. ft. organized by the Board in collaboration with the VEDC. Their products include a wide range of vitreous-enamelled cooking-ware in a variety of colours, and a new British development in this field that is making its début on the Continent—a vitreous-enamel finish on aluminium.

Pre-heating of Ladles for Casting Iron—New US Method

Chance Vought Aircraft, Incorporated, USA, have recently developed an improved method of pre-heating ladles for their foundry operations. The old method required that the ladle be positioned beneath a fixed pre-heater funnel and heated, before the charge of molten iron was poured into it. To save the labour involved in manoeuvring the ladle under the funnel, and removing it after heating, Mr. George Holman, a plant facilities engineer, has developed a pre-heater with two burners that can be rotated through 180 deg. (see accompanying illustration). The new equipment permits pre-heating to be carried out without the difficulty of pulling the ladle from beneath the fixed burner. The pre-heater has two burners, of 12 and 21 in. dia, and can thus heat two different-sized ladles at once. All the gas and air controls and the aspirator mixer are mounted on the rotatable housing of the pre-heater, and the entire assembly can be rotated on an inclined plane to raise the burners away from the ladle.



POA Oxford Course

The Purchasing Officers Association is holding its third Oxford course at Christ Church, from March 21 to 25. One of the main features of the course will be a panel discussion on the "Effect on Buying Policy and Practice of current Restrictive Practices Legislation" to be held on the morning of March 25. Taking part will be:—Mr. R. L. Sich, C.B.E., registrar of Restrictive Trading Agreements; Mr. A. H. Thomas, president of the Association, and Mr. H. R. Mattys, T.D., chairman of the Federation of British Industries, trade practices panel. The chairman will be Mr. S. W. Bennett, Deputy Director General, Purchasing and Stores, National Coal Board.

Company News

A. V. ROE (CANADA), LIMITED—The board is omitting the quarterly dividend due on April 2.

OLDINGS (HATFIELD), LIMITED—The company, a member of the Vickers, Limited, group, has acquired over 90 per cent. of the share capital of Modern Telephones (Gt. Britain), Limited.

RENOLD CHAINS, LIMITED—In order to create 2,000,000 £1 shares and to effect the one-for-two scrip issue detailed two weeks ago, an extra-ordinary meeting is called for March 29.

GAS PURIFICATION & CHEMICAL COMPANY, LIMITED—The company has withdrawn its offer for the capital of Sydney S. Bird & Sons, Limited, electrical engineers, etc., of Poole (Dorset).

FLUIDRIVE ENGINEERING COMPANY, LIMITED, fluid transmission engineers, etc., of Isleworth (Middx)—Ordinary dividend for the year ended September 30, 1959, is being raised to 12 (10) per cent.

WHARTON CRANE & HOIST COMPANY, LIMITED—The final is raised by 5 per cent. to 15 per cent. to make 20 (15) per cent. for 1959. A two-for-five scrip issue is proposed. Profits, after tax, were £37,219 (£35,398).

CAMBRIDGE INSTRUMENT COMPANY, LIMITED—The net profit for 1959 was £256,965 (£216,515) and the dividend is 12½ (11¼) per cent., tax free. A first quarterly dividend of 4 per cent., less tax, was declared on account for 1960.

GLOUCESTER RAILWAY CARRIAGE & WAGON COMPANY, LIMITED—Interim ordinary dividend for the year ending May 31, 1960, is being cut from 5 per cent. to 3¼ per cent. and is payable on April 1. The last final payment was 10 per cent.

C. & J. HAMPTON, LIMITED, toolmakers, of Sheffield—Manufacture of Record tools is to begin soon in Australia. Agreement has been reached with Ralph McKay, an Australian public company to form a new company—Hampton-McKay Pty., Limited—to carry out the project.

POLLARD BALL & ROLLER BEARING COMPANY, LIMITED—The final divided of 20 per cent. makes a 25 per cent. total for 1959 on a capital increased by a one-for-four scrip issue and represents a 7 per cent. increase over 1958. It is proposed to make a further one-for-four scrip issue to holders registered on March 28. Group profits expanded to £514,940 (£371,121) and the net profit is £279,830 (£152,738).

H. W. LINDOP & SONS, LIMITED, malleable iron-founders, of Walsall (Staffs)—Trading conditions show a considerable improvement, compared with the previous year, state the directors. An interim dividend of 6¼ per cent. on account of the year ending June 30, 1960, is announced. The interim dividend rate was cut to 3 per cent. for 1958-59, but the total was maintained at 23 per cent. with an increased final.

JOHN BOLDING & SONS, LIMITED, brassfounders and engineers, etc., of London, W.1—Profits permitting, the board intends to raise the interim dividend to 5 (2½) per cent. so as to improve the balance between the amounts paid as interim and final dividends. This, however, should not be taken as implying any increase in the total annual dividend. So far as the current year is concerned, order-books present an encouraging picture.

MATHER & PLATT, LIMITED, electrical, textile, hydraulic, and fire-protection engineers, of Manchester—Group net profit attributable to the parent for 1959 is £850,751 (£712,022) and the dividend is 11¼ (10¾ equivalent) per cent. Decrease in the company's profit margins was due to increased competition, states the chairman, Mr. L. E. Mather, but there are encouraging signs of increased business prospects in several parts of the world.

BIRFIELD, LIMITED, general engineering supplies, of London, W.1—One-for-one scrip issue is announced and a 10 per cent. dividend is forecast for 1960, against the equivalent of 7½ per cent. After tax of £592,322 (£977,281), net profit dropped to £369,611 (£502,614). This was mainly due to unremunerative prices for propeller shafts, considerable development expenditure on new projects, and losses, now ceased, by certain subsidiaries. Sales, however, increased from £4,540,000 to £5,748,000.

HALL-THERMOTANK, LIMITED—Group profits for the year ended September 30, 1959, amounted to £930,416 (£840,678), before tax of £549,516 (£461,000). The 10 per cent. dividend is as forecast. The chairman, Mr. I. M. Stewart, says there are plans for increasing the range of group products and also for taking advantage of certain new technical developments in Europe and the US. Provided there are no major upsets, trading results for 1960 should certainly be no less favourable than last year, he says.

THOS. W. WARD, LIMITED, iron, steel, and scrap merchants, etc., of Sheffield—Implementation of the proposals for the one-for-one scrip issue has been delayed pending a decision by legal advisers on certain related proposals concerning employees' shares. The points have now been resolved and it is hoped to convene the necessary meetings by June 30. Profits for the six months to December 31, 1959 were maintained on a similar level to those for the last financial year to June 30, 1959. The 5 per cent. interim is maintained.

B.T.R. INDUSTRIES, LIMITED, engineers in rubber and thermoplastics, London, S.W.1—Immediate results of the company's heavy construction and expansion programme have placed the group, as regards future prospects, in a stronger position to meet the competitive conditions which must be expected in the future. Some new developments may be expected to contribute usefully to the group profit which for 1958-59 fell from £348,120 to £328,953, after a substantially reduced tax charge. The dividend is reduced by 2½ per cent. to 12½ per cent.

HATTERSLEY (ORMSKIRK), LIMITED, engineers, iron and non-ferrous founders, etc.—A wholly-owned subsidiary—Hattersley (Canada) Limited—has been formed in Canada in connection with the creation of an organization to distribute products in Canada and the USA. The company's subsidiary, Beck & Company (Meters), Limited, has acquired additional production facilities through the purchase of all the share capital of four small private companies, Parkwood Engineering Company, Limited, Parkwood (Pumps), Limited, Parkwood (Components), Limited, and Parkwood Machinery Sales, Limited, for £67,500.

Offer for Redler Industries Declared Unconditional

The offer by Cozens & Sutcliffe (Holdings), Limited, to purchase the ordinary shares in Redler Industries, Limited, has been declared unconditional. Acceptances have been received representing more than 75 per cent. of the Redler ordinary shares. The offer remains open until tomorrow (Friday).

Cozens & Sutcliffe were bidding for Redler Industries in competition with Ley's Foundries & Engineering Company, Limited, whose offer later lapsed.

Equipment and Supplies

Belt-weighing Machine

Merrick Scale Mfg. Company, Limited, Albert Street, Bulwell, Nottingham, are now marketing the SV Weightometer belt-weighing machine (see Fig. 1) This unit has been designed for fitting to horizontal or inclined conveyors having either flat or troughed idlers, and will totalize the weight of material passed over the conveyor. The main part of the Weightometer is a mechanical integrator which continuously multiplies two varying quantities: (*a*) the load on the conveyor, and (*b*) the belt speed. Units can be supplied to suit any conveyor capacity and belt speed, and the weight recorder can be placed at a remote position if required. It is claimed that the machine can be fitted to existing conveyors with a minimum of modification, and that it is accurate to $\pm\frac{1}{2}$ per cent. of the true weight passed when the conveyor is operating at full load conditions.

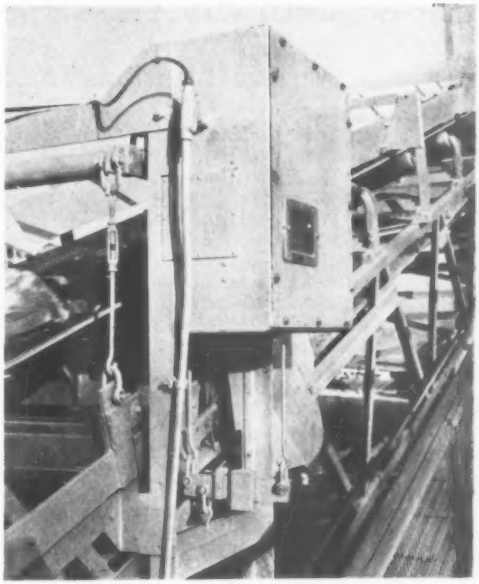


FIG. 1.—*Apparatus for the continuous weighing of material passing over a conveyor belt, introduced by Merrick Scale Manufacturing Company, Limited.*

Hematite Pig-iron

As a complete departure from normal, over the past six months Welbeck Trading Company (London), Limited, 2/6, Baches Street, City Road, London, N.1, have brought into this country from continental sources, quantities of hematite pig-iron of the following chemical composition: C 3.7 to 4.3; Si 1.5 to 2.0; Mn 0.6 to 0.8; P 0.05 to 0.08, and S 0.03 max. per cent. (Due to heavy demand on the Continent the lower-phosphorus range is becoming more difficult to obtain.) In order to deliver the material at a competitive price, so far only minimum parcels of 500 tons have been handled, but it is hoped that in the future smaller quantities will be available from stock.

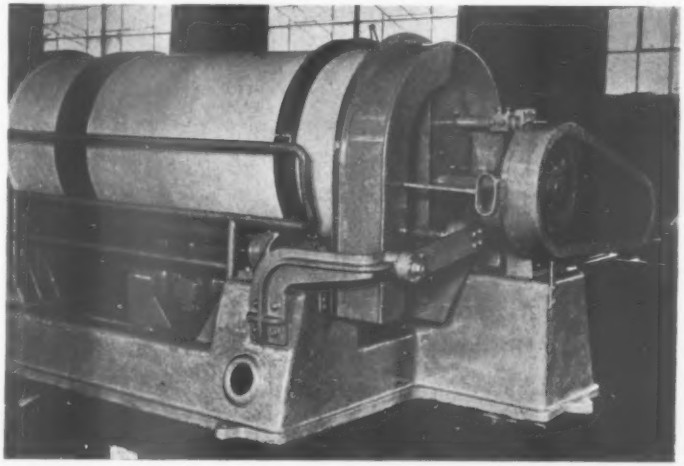
Tractor Shovel

Yale & Towne Manufacturing Company, have introduced a British version of the tractor shovel which is marketed in America and other countries under the name "Trojan." It will be marketed in the United Kingdom and Northern Ireland exclusively by Jack Olding & Company, Limited, of Hatfield, Hertfordshire, as the Yale Tractor Shovel. The first model to be introduced is the 154LD, a four-wheel drive shovel of 12,000 lb. lifting capacity. It is normally fitted with a 2-cub. yd. general utility bucket, although optional sizes of $1\frac{1}{2}$ and $2\frac{1}{2}$ cub. yd. are available for heavy and light materials.

German Moulding-sand Mixer for Export to South Africa

The illustration alongside shows one of four rotary-barrel sand-mixers which the West German manufacturers Jünkerather Gewerkschaft are to supply to South Africa in March. It is stated that each unit will produce up to 25 cub. m. (881.5 cub. ft.) of sand per hour.

The Czechoslovak corporation for controlling imports (Strojimport), which ordered a foundry moulding-sand plant — with two mixers — early in 1959, have recently placed another order with these manufacturers for a further sand-preparation system and conveyor equipment. (Jünkerather Gewerkschaft belong to the Demag concern, in Duisburg.)



Nylon Corebox Vents

W. J. Hooker, Limited, 239a, Finchley Road, London, N.W.3, have recently acquired an agency from an American maker of nylon corebox vents. These are available in sizes ranging from $\frac{5}{16}$ to $1\frac{1}{2}$ in. o.d. It is claimed that the vents resist attack by weak acids, oil and steam; that sand does not adhere to them, and that they do not restrict core stripping in any way.

Fifty-seventh IBF Annual Conference

Technical Sessions and Social Events at Malvern, June 21-24

For the first time, the annual conference of the Institute of British Foundrymen is to be held at Malvern. The dates are June 21 to 24 inclusive, and the hosts this year are the Birmingham, Coventry and West Midlands branch. Malvern, being situated on a range of hills in some of the most beautiful scenery in the country, offers excellent opportunities for excursions whilst at the same time is within easy reach of the industrial areas. Two novel features include an opportunity for ladies to visit a foundry in company with members, and for members to accompany the ladies on one of their full-day excursions. Because of the large number of works visits available, these have again been organized for the Tuesday afternoon as well as for the Thursday of Conference week.

Conference Office. The Conference office will be established on June 21 at the Pump Room, Winter Gardens, Malvern. Communications prior to this date should be addressed to the Institute's head office at 14, Pall Mall, London, S.W.1.

Programme

Brief particulars of the general programme are as follow:

Monday, June 20

Afternoon: Council and committee meetings at the Abbey Hotel, Malvern.

Tuesday, June 21

10.30 a.m.: Coaches leave the Winter Gardens, Malvern, for the Station Hotel, Dudley. Luncheon at the hotel, 12.45 p.m.

2 p.m.: Depart from the Hotel, for *one* only of the following works visits: (*a*) Arthur Shaw & Company, Limited, Willenhall, Staffs; (*b*) Beans Industries, Limited, Tipton; (*c*) Duport Foundries, Limited, Tipton; (*d*) Northern Aluminium Company, Limited, Handsworth, Birmingham, or (*e*) Bilston Foundries, Limited, Staffs. Buffet tea at Station Hotel, Dudley, before the return to Malvern, arriving about 5.45 p.m.

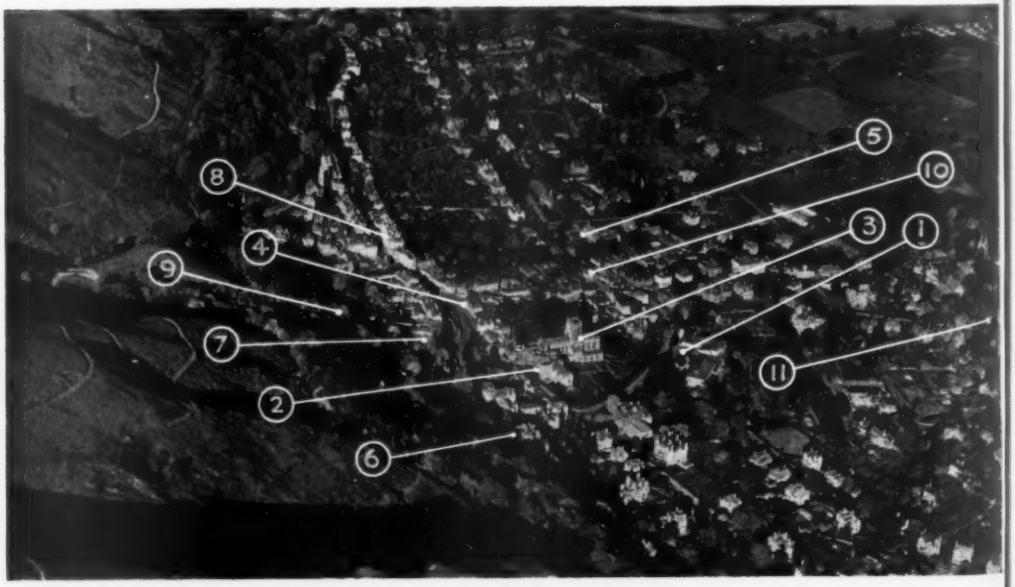
8.30 p.m. to midnight: Reception of members and ladies by the Malvern Urban District Council at the Winter Gardens.

Wednesday, June 22

9.15 a.m.: Annual general meeting of members and presentation of awards at the Festival Theatre, Winter Gardens.

Aerial view of Malvern town photographed from the south (with the Hills on the left-hand side).

Key: (1) Winter Gardens (Conference Hall, Theatre, and Cinema); (2) Abbey Hotel; (3) Malvern Priory; (4) Post Office; (5) Library; (6) Tudor Hotel; (7) Mount Pleasant Hotel; (8) Foley Arms Hotel; (9) Aldwyn Tower Hotel; (10) Beauchamp Hotel; and (11) Gold Hill Hotel.



Distant view of the Malvern Hills from the south-east. The scene is typical of the countryside lying between the river Severn and the Welsh border.

11 a.m.: Presidential adddress by Mr. G. R. Shotton, F.I.M.

11.30 a.m.: Edward Williams Lecture entitled "Research and Industry," by Mr. H. Morrogh, director of the British Cast Iron Research Association.

12.30 p.m.: Conference adjourns for luncheon, 12.45 for 1 p.m., at the Winter Gardens.

2.30 p.m.: Conference recommences with technical sessions at the Festival Theatre and Priory Lodge Hall, both at the Winter Gardens.

7 p.m.: Reception at the Winter Gardens by the president and Mrs. Shotton, followed at 7.30 p.m. by the annual banquet and dancing until 1 a.m.

Thursday, June 23

Members will take part in *one* only of the following visits, or groups of visits, departing by coach from the Winter Gardens, Malvern, and returning by about 6 p.m.

8.45 a.m.: (1) Morning: (*a*) British Piston Ring Company, Limited, and afternoon, (*b*) Humber, Limited, both firms being in Coventry.

9 a.m.: (2) All-day visit to the foundries of Sterling Metals, Limited, Nuneaton.

9.05 a.m.: (3) Morning: (*a*) Charles Carr, Limited, Smethwick. Afternoon: (*b*) John Harper & Company, Limited, Willenhall, Staffs.

9.10 a.m.: (4) All-day visit to the steel foundries of F. H. Lloyd & Company, Limited, Darlaston.

9.15 a.m.: (5) Morning: (*a*) W. & T. Avery & Company, Limited, Tamebridge Foundry. Afternoon: Shotton Bros., Limited, Halesowen.

9.30 a.m.: (6) All-day visit to Dartmouth Auto Castings, Limited, Smethwick.

11.30 a.m. (7) All-day visit to Wye Valley (joint trip with the ladies), luncheon and tea at the Royal Hotel, Ross-on-Wye.

(The various companies concerned are offering hospitality for luncheon and tea during the works visits).

7.30 p.m.: A play or variety show at the Festival Theatre, Malvern, with, at 10 p.m.: "Theatre Club" at the Winter Gardens (light music and refreshments).

Friday, June 24

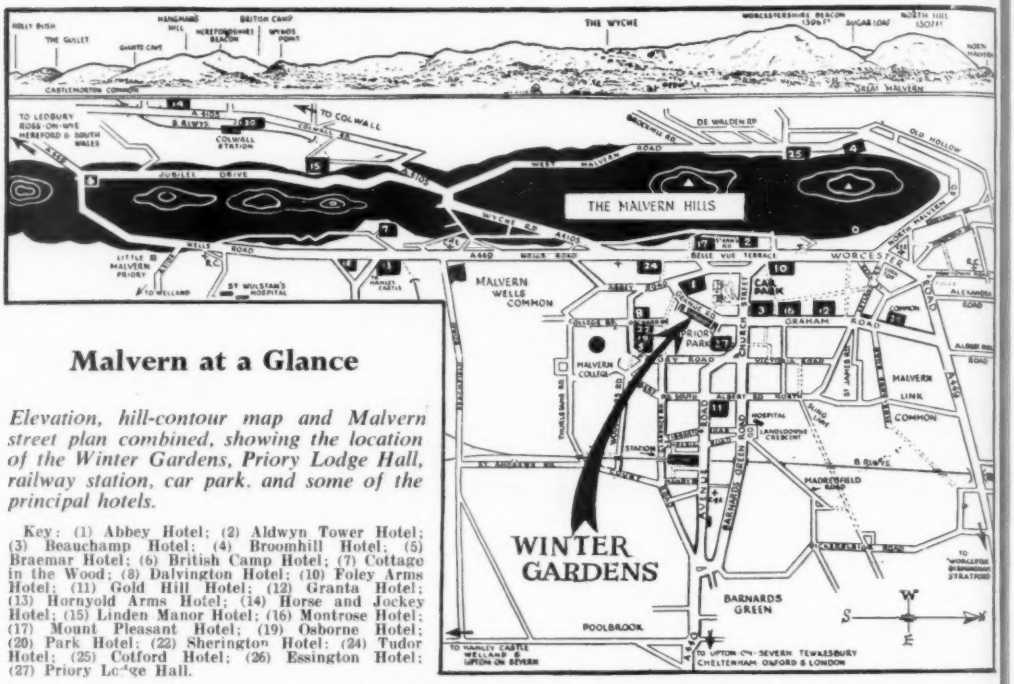
The whole day will be devoted to technical sessions, followed in the evening with a dinner, dance and cabaret at the Winter Gardens starting at 8 p.m., until 1 a.m. For details of technical sessions see later.

Ladies' Programme

Tuesday, June 21

2 p.m.: Leave by coach for *one* of the following visits: (1) Arthur Shaw & Company, Limited,

Closer view of Malvern town, which closely follows the contour of the Hills (on the lower slopes of which it is built).



Malvern at a Glance

Elevation, hill-contour map and Malvern street plan combined, showing the location of the Winter Gardens, Priory Lodge Hall, railway station, car park, and some of the principal hotels.

Key: (1) Abbey Hotel; (2) Aldwyn Tower Hotel; (3) Beauchamp Hotel; (4) Broomhill Hotel; (5) Braemar Hotel; (6) British Camp Hotel; (7) Cottage in the Wood; (8) Dalvington Hotel; (10) Foley Arms Hotel; (11) Gold Hill Hotel; (12) Granta Hotel; (13) Hornyold Arms Hotel; (14) Horse and Jockey Hotel; (15) Linden Manor Hotel; (16) Montrose Hotel; (17) Mount Pleasant Hotel; (19) Osborne Hotel; (20) Park Hotel; (22) Sherington Hotel; (24) Tudor Hotel; (25) Cotford Hotel; (26) Essington Hotel; (27) Priory Lodge Hall.

Willenhall; (2) the glass works of Webb Corbett, Limited, or (3) Thos. Webb & Sons, both of Stourbridge; or (4) for a visit to Dudley Castle and Zoo. (From 8.30 p.m., programme as for members.)

Wednesday, June 22

11 a.m.: Reception and coffee at the Abbey Hotel, Malvern; and in the afternoon at 3 p.m., a fashion show is to be given by Chas. Wm. Davis, Limited (of London), in the restaurant at the Abbey Hotel. (Evening programme as for members.)

Thursday, June 23

Ladies may participate in *one* only of the following visits:—

10.45 a.m.: (1) Visit to Stratford including a tour of Mary Arden's house and of Hall's Croft; return to Malvern by about 6.15 p.m.

11.30 a.m.: (2) Visit to Broadway, followed by afternoon visit to showrooms of Gordon Russell, Limited, furniture manufacturers, returning to Malvern about 5.15 p.m.

11.30 a.m.: (3) Tour of the Wye Valley (joint trip with menfolk), returning to Malvern about 5.45 p.m.

11.30 a.m.: (4) Visit to the carpet factory of Brintons, Limited, Kidderminster; returning to Malvern about 5.30 p.m.

Evening programme as for members.

Friday, June 24

11.30 a.m.: Ladies may participate in *one* only of the following visits, leaving by coach from the Winter Gardens: (1) Visit to Hereford, followed by visit to the Old House, and then afternoon free for shopping; (2) to Ledbury, followed by visit to Birtsmoreton Court in the afternoon (arriving at Malvern on return at 5.30 p.m.); (3) works tour of Worcester Royal Porcelain Company, Limited, preceded by a visit to the city's Cathedral, arriving back at Malvern 5.15 p.m. (Evening programme as for members.)

Technical Sessions

Wednesday, June 22

2.30 to 5 p.m.: Two simultaneous sessions.

Session A. (Festival Theatre, Winter Gardens, Malvern.) Paper No. 1, Third Report of Sub-committee TS43—Cupola Developments; No. 2, "Uncooled Basic Cupola," by B. R. Douglas; No. 3, Third Report of Sub-committee TS32—Internal Stress.

Session B. (Priory Lodge Hall, Winter Gardens, Malvern.) Paper No. 4, "Aluminium Castings in the Deltic Engine," by R. Eade and K. Evans; No. 5, "Close-tolerance Castings in Aluminium Alloy," by J. C. Bailey; No. 6, "Aluminium Side-scuttles for Marine Purposes," by E. Elliott.

Friday, June 24

9.30 a.m. to 12.30 p.m.: Two simultaneous sessions.

Session C. (Festival Theatre, Winter Gardens, Malvern.) Paper No. 7, "The Solidification of Cast-iron and the Interpretation of the results obtained from Chilled Test-pieces," by H. Morrogh.

No. 8. "Pearlitic-malleable Iron," by Carl F. Joseph, B.S.; No. 9, "Properties of Ferritic Blackheart-malleable Cast Iron," by C. T. Moore.

Session D. (Priory Lodge Hall, Winter Gardens, Malvern.) Paper No. 10, "Aluminium Pressure-die-casting," by J. C. Reed; No. 11, Some Aspects of present South African Foundry Practice," No. 12, "Moulding-sand Practice in Australia," by H. A. Stephens, B.SC.

Session E. (Festival Theatre, Winter Gardens, Malvern.) Paper No. 13, "Effect on a Green-sand of Contamination by used CO_2-Process Sand," by J. M. Middleton, A.MET., A.I.M.; No. 14, "The Effect of CO_2-Process Sands on Hot-tearing," by J. M. Middleton, A.MET., A.I.M.; No. 15, Second Report of Sub-committee TS39—Mould Drying.

Session F. (Priory Lodge Hall, Winter Gardens, Malvern.) Paper No. 16, "Sand-cast Test-bar for 85/5/5/5 Gunmetal," by H. Reiter, B.SC.; No. 17, "The Properties of Castings in Shell Moulds," by W. W. Glick, A.I.M.; No. 18, Second Report of Sub-committee TS 45—Non-ferrous Melt-quality tests.

Hotel Accommodation

With regard to accommodation in Malvern, it should be pointed out that the town lacks large hotels, and members must necessarily be dispersed amongst a number of smaller hotels. All requiring accommodation locally are requested to make their own bookings direct with the hotel of their choice (a list is available from the Institute) at the earliest possible moment, and in any case not later than May 20, mentioning the Conference when doing so. The smallness of the hotels makes it possible that several applications may be necessary and, to avoid this inconvenience, unless a specific request is made to the contrary, members' reservations which cannot be met by a particular hotel will be passed to a bureau established by the Malvern hotels, which will offer accommodation at the nearest comparable premises.

The latest date for receiving conference reply forms (at the London office of the Institute) is May 20.

P.G. Engineering's Orders

Contracts for process plant from Canada and India, worth more than £1,250,000, have been awarded to P.G. Engineering, Limited, of Stockton-on-Tees, a member of the Power-Gas Group. The company has already reported the receipt of orders worth £9,300,000 in the first four months of its current financial year.

The Canadian order awarded by Brockville Chemicals, Limited, to P.G. Engineering and its associate, Power-Gas, Canada, Limited, of Montreal, is for the design and construction of a hydrogen plant for a new works now being built at Maitland, Ontario. The plant will cost about $1,800,000 and should be completed early next year.

The second order, from Fertilisers & Chemicals, Limited, Travancore, South India, is for a Texaco partial oxidation gasification plant to produce carbon monoxide and hydrogen.

The Cock in Cast Iron

The cock has been a subject for casting because he was allied with ancient religious cults as well as the Christian faith. In fact, an iron rooster was made by Chang Wen way back in the dynasty of Tien Pao, *circa* A.D. 550—of course, iron was known in China from about 2000 B.C. It is said by an 18th century Irish archæologist that a cock cast in copper or bronze, in his collection, dated from about the 8th century A.D., having been found on the site of the house of St. John, near Killough, Co. Down, in 1750. This cock would of course have been the symbol of the denial by St. Peter. Weathercocks have frequently been cast in iron, and

FIG. 1.—*Cast-iron inn-sign, embodying a cock, originally built into the wall of the "Crowing Cock," in Belfast.*

on their lofty perches have weathered well. The great drawback with the cast-iron bird of the weather, however, was that it was too heavy to be "sensitive to the gentle breeze," as was Sam Lover's weathercock in verse.

In the 17th century firebacks the crowing cock was not an unusual feature, the sight of this symbol behind the grate when the embers were low in the morning being said to typify the hope of a cheerful day to come. Cocks on cast-iron grave slabs had an obvious message to the living, and were also the token of hope for the soul in limbo. Cast-iron signs for inns embodying a cock were often seen in the 18th century, and the one shown in Fig. 1 was once built into the wall of the "Crowing Cock" in Belfast. Back in 1828, Jackson Lloyd, a squire of Tamnamore Manor, Co. Tyrone, who kept fighting game cocks, had a model made in iron of one of his favourite birds, who had fought and won in many mains. This model, founded at Armagh, was mounted on a cut-stone Doric column on the squire's lawn.

Correspondence

SPECIFICATIONS FOR GUNMETAL

To the Editor of THE FOUNDRY TRADE JOURNAL

SIR,—Last October I had the good fortune to attend the London meeting of the Institute of British Foundrymen addressed to the topic of "Specifications for Gunmetal," and in the company of my good friends I was invited to comment upon the corresponding situation in the US.

I was able to report that a considerable amount of investigative work was conducted for the Brass and Bronze Ingot Institute in the US at Battelle Memorial Institute. The results in general indicated that strength levels in existing US specifications were excessively low and that an increase of approximately 10-15 per cent. in tensile strength and yield strength would add a corresponding improvement to the stature of the brass and bronze alloys. In this family of compositions were the tin bronzes of the "G" bronze, "M" bronze of the 88 copper/6 tin/4 zinc/2 lead-type and the 85/5/5/5 type, corresponding to BSS 1400: G.1, L.G.3 and L.G.2. Some mention was made that manganese- and aluminium-bronzes were also being surveyed.

I had the temerity to predict that accomplishments in the brass industry provided an ample support for the advancement of the strength levels for these materials. These predictions, published in your excellent summary of this meeting (FTJ Jan. 21, 1960, p. 79) have been proven false. At the recent meeting of ASTM Committee F1 of B-5 dealing with bronze and brass castings, the secretary reported that a preliminary poll of Committee members indicated that approximately one half of their number preferred not to disturb casting specifications. This group included some of the most important consumers of the product. In the light of this "straw" vote, the Committee officials supported by attending members agreed that the survey proposing higher specification values should be pigeonholed and not subjected to Committee F1 vote since ASTM rules require a 90 per cent. acceptance. Under the circumstances existing ASTM specifications will continue at their present levels, for example:

US Spec.	Nominal composition, per cent.				Mechanical properties, (min.).			Equiv. B.S.S. 1400
	Cu	Sn	Pb	Zn	Tensile,* tons per sq. in.	Yield,† tons per sq. in.	Elong., per cent.	
B 61	88	6	1.5	4	15.1	7.2	22	LG-3
B 62	85	5	5	5	13.4	6.3	20	LG-2

* To facilitate comparisons, Mr. Vanick's figures of 34,000 and 30,000 lb. per sq. in. respectively have been converted to English tons—Editor.

† Original figures here were 16,000 and 14,000 lb. per sq. in respectively.

It must have been my lifelong struggle in the interest of improving the mechanical properties of bronzes with a view toward achieving wider acceptance for these materials that influenced my prediction that up-grading the specifications by ASTM would occur.

Please publish if you will this retraction of my October prediction which will also represent my apology to the London branch of the IBF. Yours etc.,

JAMES S. VANICK,

Development & Research Division, International Nickel Company, Inc.

67, Wall Street,
New York 5.
March 7, 1960.

Factory "Switch"

A major change round in production facilities in the Pulsometer group of companies will mean that later this year the firm of Joseph Evans & Sons (Wolverhampton), Limited, will leave Wolverhampton. Joseph Evans, Limited, pump makers, was founded in 1810, thus making the company 150 years old this year. Eight years ago it became a subsidiary of the Pulsometer Engineering Company, Limited.

When the company leaves Wolverhampton for the main Pulsometer works at Reading, another of the group's subsidiary companies, Skyhi, Limited, makers of high-pressure-hydraulic equipment of all kinds, will be moving from Isleworth to Culwell Works, Frederick-street, Wolverhampton. Mr. F. G. Howson, general manager of Culwell Works, told a FOUNDRY TRADE JOURNAL reporter that: "The parent company feels, in the circumstances, that it would be better to concentrate all its pump manufacture in one works at Reading." He added, "Skyhi wanted to expand, but could not do so in its present crowded position at Isleworth."

At the present time Joseph Evans, employs about 240 workpeople and 112 staff. Some of these are being asked to move to Reading and also some Skyhi employees will be asked to move to Wolverhampton.

IBF Malvern Conference Fund

The Council of the Institute of British Foundrymen acknowledges with appreciation the following donations to the Malvern conference fund which have been received in addition to those listed in the February 11 issue of the JOURNAL. The list is not yet closed and Dr. H. T. Angus of the British Cast Iron Research Association, Alvechurch, Birmingham, who is honorary treasurer of the fund, will be glad to receive additional subscriptions:—

	£	s.	d.
Previously acknowledged	1,899	17	0
Ford Motor Company, Limited	100	0	0
George Cohen Sons & Company, Limited	52	10	0
Rudge Littley, Limited	25	0	0
Arthur Smith	5	5	0
Taylor's Foundry, Limited	3	3	0
Castings, Limited	52	10	0
G. Clancey, Limited*	25	0	0
James Durrans & Sons, Limited	10	10	0
Star Foundry Company, Limited	10	10	0
Metals & Equipment (Wolverhampton), Limited	10	10	0
	2,194	15	0

* A further donation making a total of £30-5-0 from this firm.

Sankey's reconstruct 106-year-old Factory

At a cost of about £1,500,000, the 106-year-old factory of Joseph Sankey & Sons, Limited, at Albert Street, Bilston, Staffs, has been reconstructed around the workers as they carried on with their jobs. One of the reasons which prompted the company to rebuild in this way, was the fact that no new site was available, and to have had the old building demolished and built anew would have meant holding up production. Another important factor was that the firm's employees are not only highly skilled and mostly irreplaceable, but also the labour force is one of the largest in the town. Thus, the company decided that its own interests and those of the local community would be best served if Sankey's remained in Bilston. Facilities provided by the new building have enabled the company to double its productive capacity. One of the novelties of the factory is a press shop containing more than 100 presses, ranging from 25 to 1,000-ton capacity, with a suspended floor. The two parts of the works are connected by conveyors across a road.

News in Brief

THE NEWCASTLE OFFICE of United Dominions Trust, Limited, moved on March 14 to new premises at 12, Mosley Street, Newcastle-on-Tyne, 1.

THE BRITISH STANDARDS INSTITUTION, 2, Park Street, London, W.1, announce the publication of "Methods of test and rating for hot-water air-heater batteries." B.S. 3208: price 7s. 6d.

MARK TYZACK & SONS, LIMITED, die-sinkers, Carlisle Street, Sheffield, were fined £50 in Sheffield on March 11 for contravention of the Factories Act in not making effective provision for fire warning.

RECORD CAPITAL EXPENDITURE of $159,000,000 is planned by the Republic Steel Corporation, of Chicago, US, as part of a five year $375,000,000 programme designed to improve efficiency and versatility.

AGREEMENT HAS been reached between the Cologne firm of J. Meissner and Leonard Smith (Engineers), Limited, London, S.W.1, for mutual support throughout the world in the sale of their formaldehyde processes.

ABERDEEN CORPORATION'S planning committee has approved an application by John M. Henderson & Company, Limited, manufacturers of aerial and cable ropeways, engineers, and ironfounders, to extend its King Street iron foundry.

NEW COMMERCIAL VEHICLE factory at Ellesmere Port, on the south shore of the river Mersey, to be built by Vauxhall Motors, Limited, Luton, will have an area of more than 2,500,000 sq. ft. and will eventually employ about 7,000 people.

IT IS REGRETTED that, in the JOURNAL of March 10, it was stated under the heading "UK Site for Chrysler?" that the Chrysler Corporation produces the "Falcon" car. This is a Ford production, the compact car made by Chrysler being the "Valiant."

SPEAR & JACKSON, LIMITED, Sheffield, were visited on March 10 by a party of Nepalese citizens who are on a tour of Britain as guests of the Foreign Office. They are Colonel J. R. Shrestha, Mr. S. R. Sharma, Mr. T. S. Phadhan, and Mr. G. P. Koirala.

SUFFOLK IRON FOUNDRY (1920), LIMITED, announce that two new power mowers are to be introduced for the 1960 season—the Colt 12-in. roller mower, fitted with a four-stroke engine, and the Centaur, a rotary power-mower fitted with a four-stroke Clinton engine and which gives an 18-in. cut.

RETURNED FROM THE LEIPZIG SPRING FAIR, where he was in charge of the British Information Bureau, Mr. Anthony J. Cox, general manager of the Birmingham Engineering Centre, reports favourably on prospects for British exports behind the Iron Curtain. Addressing the annual general meeting in Birmingham of the Engineering Centre, on March 10, he said he was certain that prospects of trade with the Communist countries were sound.

NORTH EASTERN MARINE ENGINEERING COMPANY, LIMITED, a member of the Richardsons Westgarth group, has received orders for four N.E.M. Götaverken diesel-engines for British and Norwegian owners, with a total output of 26,000 b.h.p. All four engines are of the single-acting two-cycle type and are turbo-charged. Two are for bulk carriers and two for general-cargo vessels. Delivery of all four ships will be for the second and third quarter of next year.

HEAD, WRIGHTSON IRON AND STEELWORKS ENGINEERING, LIMITED, a subsidiary of Head, Wrightson & Company, Limited, Thornaby-on-Tees, have secured a contract for the design and construction of a materials-handling and iron-ore sintering plant for the Skinningrove Iron Company, Limited, at their works at Carlinhow, North Yorkshire. The contract is worth £700,000. It is intended that the plant will eventually produce 7,000 tons of self-fluxing blast-furnace sinter per week.

FOR THE FIRST TIME since January, 1957, all five blast furnaces of Stanton Ironworks Company, Limited, near Derby, are in operation. Miss Margaret Wilson, daughter of Mr. C. H. Wilson, general assistant to the assistant managing director (works) lit the No. 5 furnace this week. This furnace was blown out last September, has since been relined and enlarged, and is now the biggest at Stanton. When fully commissioned the furnace is expected to produce 2,500 to 3,000 tons of pig-iron per week.

THE BOARD OF TRADE announce that they have agreed to sell their stockpile of aluminium, originally acquired from Aluminium Union, Limited, to Alcan (UK), Limited, who have recently succeeded the former company as the United Kingdom distributors of Alcan aluminium. A minimum rate of purchase has been agreed. Alcan (UK), Limited have taken approximately 10,000 tons under the agreement and the 27,000 tons now remaining in the stockpile will be delivered to them not later than June 30, 1964.

THIRTY-FOUR British scientific-instrument makers will be participating in the Scientific Instrument Exhibition to be held in Moscow at the Polytechnic Museum from June 18 to 29. This exhibition, negotiations for which have been carried out by the Scientific Instrument Manufacturers' Association of Great Britain, will be entirely financed by the industry itself through the charges to exhibitors. As reported in the JOURNAL, February 4 issue, it is believed to be the first to be put on in Russia by a British organization of manufacturers in a specialized field.

REPRESENTATIVES of Vecor of Vanderbijlpark, South Africa, returned from London on February 23 after negotiating a £2,000,000 agreement with Rubery Owen, of Britain, which will result in the manufacture of component parts for motor vehicles in the Union. The agreement between both organizations provides for the manufacture in South Africa of wheels, axle housings, petrol tanks, chassis frames, body pressings, and other components. In addition to its considerable financial investment in the new project, Rubery Owen will contribute design work, tooling and "know-how" from their own resources.

SIMON-CARVES, LIMITED, of Cheadle Heath, Stockport, has secured an order from the East India Distilleries and Sugar Factories, Limited, for the construction of a new factory at a total cost of about £3,000,000. The factory will have a compound fertilizer plant, plants for the production of synthetic ammonia, sulphuric acid and phosphoric acid, together with equipment for handling incoming raw materials and outgoing finished products; 51,000 tons a year of compound fertilizers based on ammonium phosphate will be produced in the new factory to be built at Ennore, near Madras. It is expected to come into production in two years.

BRITISH TRANSPORT COMMISSION announce that British Transport Docks have placed a contract for the construction of two single-storey transit sheds at No. 12 Quay, King George Dock, Hull. The new sheds, which are each 500-ft. long by 150-ft. wide, with associated works to improve rail and road facili-

News in Brief

ties, will complete the modernization of this quay which has recently been reconstructed in concrete. The main contract for the construction of the sheds and for the associated rail and road works has been awarded to A. Monk & Company, Limited, of Padgate, Warrington. Steelwork will be provided and erected by the South Durham Steel & Iron Company Limited, of Middlesbrough, as sub-contractors.

FOUR MEETINGS ON AUTOMATION have been organized by the South-East Staffordshire Productivity Association. The first of the series was held at the works of Smith & Davis, Limited, Wednesbury, and the second, on March 1, at Guest Keen & Nettlefolds (Midlands), Limited, Darlaston, when Mr. R. H. Minns, managing director of the Copper and Asbestos Washer Company, Limited, was the speaker. The third meeting in the series will be held at the works of Rubery Owen & Company, Limited, on March 29 when the practical application of automation will be illustrated. To end the series, a film with a commentary by Mr. Ed. Murrow (the American television personality) will be shown on April 25 at Rubery Owen's. Mr. J. B. Jay will be the speaker.

AS A MAJOR SUPPLIER of components to the motor industry, it is likely that Rubery Owen & Company, Limited, of Darlaston, Staffordshire, will seek to follow some of the motor industry's extension plans in areas of high unemployment. Mr. A. G. B. Owen, chairman and joint managing director, made a reference to possible expansion in Scotland, when talking recently to apprentices at Salopian Engineers, Limited, Prees, Shropshire, an Owen organization subsidiary. Subsequently, a spokesman for the company said that the project was still very much in the negotiation stage, but it was a logical step for a company so heavily engaged in supplying the motor industry. It was likely that the Rubery Owen plan would meet with Board of Trade approval and that a factory might be provided on the same terms as those already promised to the British Motor Corporation, which is planning to employ 5,600 workers at Bathgate, in West Lothian.

Obituary

Mr. ARTHUR R. KNOWLES, secretary of Sheffield Chamber of Commerce from 1935 to 1945, and former secretary-general of the Association of Chambers of Commerce, has died at the age of 61. In 1945-46 Mr. Knowles was director of the Joint Iron Council.

Mr. ARCHIBALD T. ALEXANDER, company secretary of John M. Henderson & Company, Limited, iron-founders and engineers, Aberdeen, died on March 4 at the age of 49. He had been with the firm 27 years, 10 of which he had been secretary.

Mr. OSCAR RENDELL, a director of H. W. Kearns & Company, Limited, manufacturers of machine tools, etc., of Altrincham, since 1927, has died. For more than 51 years with the company, he was also a past president of the Manchester Association of Engineers. At the end of the war he was a member of the team which investigated the German machine-tool industry.

Sir EDWARD CROWE, Comptroller-General of the Department of Overseas Trade from 1928 until 1937, died in Cairo last week. He was 82. Sir Edward was chairman of Croda, Limited, chemical and paint manufacturers, of Goole (Yorks), and a director of W. T. Henley's Telegraph Works Company, Limited, Marconi's Wireless Telegraph Company, Limited, and the English Electric Company, Limited.

Mr. GEORGE WOOD, C.B.E., vice-president of Thos W. Ward, Limited, Albion Works, Sheffield, died on March 14, at the age of 78, after a long illness. Mr Wood was educated at Sheffield technical day school and joined the firm in 1897 when the offices were in Fitzalan Chambers. He became a local director in 1919, a director in 1923 and assistant managing director in 1928. He was appointed joint managing director and deputy chairman in 1941, and chairman in 1950. He relinquished the chairmanship in 1954 and became vice-president. Mr. Wood, who was awarded the C.B.E. in the 1951 Birthday Honours, was engaged in the Ward group for 57 years and was chairman or managing director of a number of subsidiary companies but had given up most of these during the past few years.

Recent Wills

OXLEY, L. B., retired machine-tool designer, of Shipley (Yorks) £9,5

CARTER, GEORGE, engineer and managing director of Ada (Halifax), Limited, washing machine manufacturers £181,5

THOMPSON, A. G., former secretary, dry docks department (Wallsend), of Swan, Hunter, & Wigham Richardson, Limited £2,1

DUFF, G. A., formerly chief engineer of Joseph Crosfield & Sons, Limited, chemical manufacturers, of Warrington £74,5

BARKER, S. N., chairman of Bardic, Limited, manufacturers of aluminium die castings, of Northam, Southampton, and formerly managing director of the British Power Boat Company, Limited, Hythe (Kent) £14,6

Richard Baxendale Long-service Awards

Six employees of Richard Baxendale & Sons, Limited (Baxi fires), Chorley, Lancs., were presented with gold watches, in recognition of their long service, at the company's annual dinner/dance at Chorley Town Hall recently. About 300 attended. The presentations were made by Mr. John Baxendale, chairman and managing director, and Mr. P. S. Baxendale, general manager. welcomed the company's representatives and agents who had travelled from all parts of the country to attend.

One of the recipients of a gold watch was Mr. J. Greenhalgh who had served with the firm for 50 years before retiring last year. His father and brother had served 54 and 15 years respectively, making a total of 119 years for one family. Other recipients who had been with the firm since leaving school were Mr. S. Parkinson (39 years), Mr. W. Gregory (30 years), Mr. W. Snape (30 years), Mr. T. Rushton (26 years) and Mr. J. Berry (26 years).

Data Book on Cast Iron

It is learnt that the preparation by the British Cast Iron Research Association of a book which will contain comprehensive data on cast iron is now well advanced and the book should be available in May. It will be in one volume and the price is likely to be in the region of from £2 2s. to £2 12s. 6d.

THE NEW ZEALAND GOVERNMENT on March 9 invited tenders for a diesel-electric passenger-carrying train and car ferry to conduct a service between the North and South Islands of New Zealand across Cook Strait. The vessel will be twin screw of about 370-ft length overall, of 15-ft. 6-in. draught and capable of a trial speed of 19 knots.

Electrical Aids in Industry *Data Sheet* **No. 11**

Dielectric Heating - 2

The ability of dielectric heating to generate heat through the mass of a suitable material provides the following considerable advantages over other heating methods.

1. A body of uniform section and composition is heated uniformly throughout. Hence there is no waiting for heat to be conducted to the centre of the body, and this is of particular advantage when the body is thick, and, as is often the case with dielectric materials, has poor heat-conducting properties.

2. The rate of heating can be faster than by external heating methods.

3. Since there is no external heat source, overheating or burning of the surface of a heat-sensitive material is avoided.

4. Heat input and heating time can be positively controlled.

5. High thermal efficiency is achieved.

6. Production can start immediately after switching on, and no current is used, nor heat lost, during periods of shut-down.

7. Vastly increased productivity is obtainable with less labour (usually unskilled), and fewer machines and less floor space are required.

8. Dielectric heating provides flexibility of layout and can be inserted directly in the production line.

Dielectric Heating: typical application data

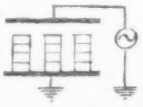
Typical application	Frequency	Radio frequency power
Thermoplastic welding.	20-100 Mc.p.s.	Up to 1 kW
Plastic preheating, wood glueing.	10-40 Mc.p.s.	2-30 kW
Plywood manufacture.	2-10 Mc.p.s.	Above 30 kW

Note: 1 Mc.p.s. = 1,000,000 cycles per second.

A few of the industrial applications of dielectric heating are briefly described below.

Preheating Thermosetting Plastics

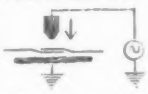
Dielectric heating is ideal for preheating pellets used for thermosetting plastic mouldings, which are poor heat conductors. It promotes faster curing, reduces moulding time and can increase production 10 to 15 times. Tool wear and damage to metal inserts are reduced, and thicker sections can be moulded.



Welding of Thermoplastic Materials

An important and extensive application of dielectric heating is the welding of thermoplastic sheets in the fabrication of such commonly used articles as raincoats, hoods, handbags, pouches and packaging materials. Dielectric heating is the only method which can usefully be employed, since the heating electrodes, and hence the outside sheet surfaces, remain cool while the inside surfaces forming the joint are fused, and a perfect weld results.

Two or more thermoplastic sheets are welded under pressure from electrodes suitably shaped to the area of weld required, the current being switched on at the same time as pressure is applied, and off when the weld is completed and the pressure released. Stitching is thus eliminated and a far stronger joint achieved.



In some cases, a suitably profiled electrode can be fitted with a knife edge to cut the sheets immediately outside the weld line, welding and pattern-cutting being thereby carried out in the one operation. Dielectric welding can be applied also to very large thermoplastic products such as linings for swimming pools, and cinema screens.

Drying

Drying of materials by dielectric heating has the great advantage that the material tends to dry out from the centre, the reverse of what happens when external heating methods are employed, and the risk of overdrying and overheating of the surface is eliminated. While the removal of large amounts of water from inexpensive commodities may sometimes be uneconomical, dielectric heating in the production line often leads to a higher overall production efficiency. It is valuable for removing final moisture traces and becomes increasingly economical as the value of heat-sensitivity of the commodity increases.

For further information get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, London, W.C.2. Telephone: TEMple Bar 9434.

Excellent reference books on electricity and productivity (8/6 each, or 9/- post free) are available — "Induction and Dielectric Heating" is an example.

E.D.A. also have available on free loan in the United Kingdom a series of films on the industrial uses of electricity. Ask for a catalogue.

6774-4

Personal

Mr. HAROLD E. GREEN has been appointed managing director of *Modern Castings* published by the American Foundrymen's Society.

Mr. N. D. MATHIE, assistant secretary of Johnson & Philips, Limited, has been appointed secretary in the place of Mr. A. B. ADAM, who has retired.

Mr. WALTER SAMPSON, director and general manager of Thos. W. Ward (Australia) Pty., Limited, is on a month's visit to the parent company of Thos. W. Ward, Limited, Sheffield.

Mr. AUBREY JONES, M.P. for Hall Green, has been appointed a director of Guest Keen Iron & Steel Company, Limited. He will act as advisor to the GKN group on economic affairs.

Mr. EDWARD TAUCHERT has been elected chairman of Venner, Limited, in place of the late Mr. ARTHUR A. ROWSE. He will remain as managing director of the company and its subsidiaries.

Mr. J. E. SMITH, managing director of the National Gas & Oil Engine Company, Limited, Ashton-under-Lyne, has been elected to the board of Rists Wires & Cables, Limited, Newcastle, Staffs.

Mr. K. M. COLE has been appointed secretary to Leicester Lovell & Company, Limited, in succession to Mr. H. A. COLLINSON, who has resigned that position but continues as managing director.

Mr. C. C. BIRCH has been appointed assistant managing director of Guest Keen & Nettlefolds (Midlands), Limited. Mr. Birch is on the board of L. H. Newton & Company, Limited, a GKN subsidiary.

Mr. W. J. WYERS has been appointed products assistant chief designer to the research and development department of Rubery Owen & Company, Limited, Darlaston, the parent company of the Owen organization.

Wing-Commander J. M. AITON, chairman and managing director of Aiton & Company, Limited, pipe engineers, of Stores Road, Derby, has been elected president of Derby and Derbyshire Chamber of Commerce.

Mr. WILLIAM L. MATHER, director in charge of the general machinery and food-machinery departments of Mather & Platt, Limited, will be elected chairman of the company on April 1 in place of Mr. L. E. MATHER, who retires.

Mr. ROBERT LESLIE HUNTER, a director of Allied Ironfounders, Limited, and of Callendar Abbott Foundry Companies, Limited, Falkirk, has been appointed a member of the Scottish Committee of the Council of Industrial Design.

Mr. R. GORE, formerly a manager with the Sheepbridge Engineering Company, Limited, Chesterfield, has been appointed to a newly-created post, that of facilities manager, for F. Perkins, Limited, diesel-engine manufacturers, Peterborough.

At the fourteenth annual general meeting of the British Bronze and Brass Ingot Manufacturers' Association, held in Birmingham last Tuesday, Mr. JAMES H. BARWELL, J.P., was elected president and Mr. J. N. COHEN, vice-president, for 1960/61.

Mr. JAMES L. WEIR has been appointed representative of the Clyde Alloy Steel Company, Limited, in the Sheffield area. He has been with the firm for more than 21 years and was formerly in charge of the tool steel department at Craigneuk Works, Motherwell.

Mr. R. E. LANDSBERT, who was chairman of the National Association of Lift Makers from 1954 to 1956, has been appointed a director of Marryatt & Scott, Limited, and of Marryatt & Place, Limited, both of which are operating subsidiaries of Marryatt & Scott Holdings, Limited, Liverpool.

Mr. A. J. B. WENTWORTH, a mechanical engineering apprentice, was awarded the Centenary Cup of Belliss & Morcom, Limited, as "apprentice of the year" at the company's annual apprentices' prizegiving on March 4. The awards were presented by Mr. F. Garner, deputy managing director of Joseph Lucas, Limited.

Mr. EDWIN STOKES (71), retired on March 4 after 55 years as a moulder at George Salter & Company, Limited, the West Bromwich spring and spring balance manufacturers. The Stokes have a proud family tradition at Salters—brother Jack retired after 5[illegible] years' service as a moulder, and brother Arthur who is maintenance foreman, has been with the firm for just over 35 years.

Mr. F. W. KNIGHT has been appointed general sales manager of Taskers of Andover (1932), Limited, in succession to Mr. C. A. LAWRENCE, who retired recently owing to ill-health. Mr. Knight has had considerable experience in the trailer industry and was for many years sales manager with Hands (Letchworth), Limited. He was later sales manager to the Triangle Motor Company, Limited, Hull.

Shell Chemical Company announce that as a result of expanding business it has been found necessary to divide the solvents and general chemicals sales section in Midland sales region, Birmingham. With effect from March 1, Dr. H. G. C. BATES is appointed chemicals sales manager. Solvents sales will remain under the management of Mr. D. MEADOWS JONES, formerly sales manager for both sections.

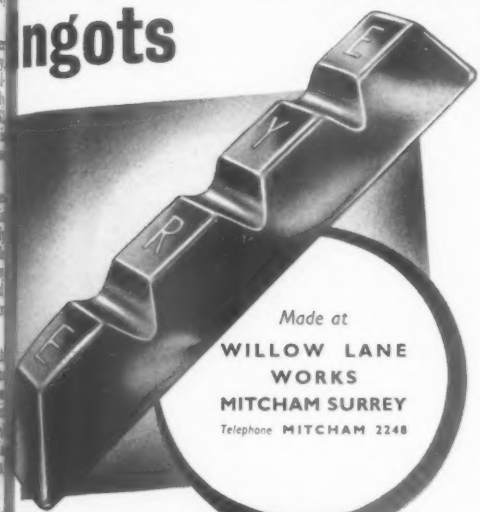
Successor to Mr. E. J. SOLVAY as president of the Society of Chemical Industry is Sir ALEXANDER FLECK, K.B.E., D.SC., F.R.S., who recently retired from the chairmanship of Imperial Chemical Industries, Limited. Sir Alexander's installation as president will take place at the annual meeting of the Society at Bristol in July. He holds the Messel and Castner Medals of the Society of which he has been a member since 1917.

Mr. W. G. MUNDAY, A.M.I.MECH.E., who has been appointed works manager at the Pontypridd works of Brown Lenox & Company, Limited, general engineers and steelfounders, served his apprenticeship with the G.W.R. Company at Swansea Docks and afterwards at Swindon locomotive works. In 1947, he joined the construction staff of the Steel Company of Wales, Limited, and nine years later moved to Brown Lenox as design engineer.

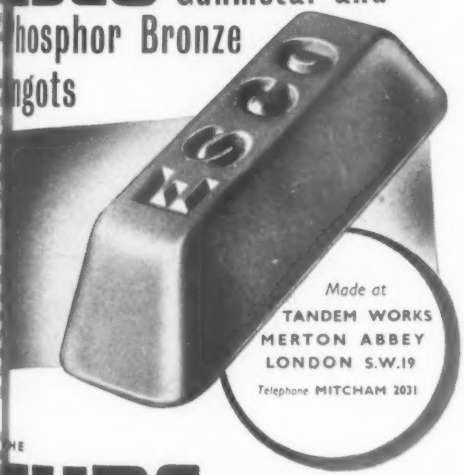
The Vitreous Enamel Development Council announce the appointment of Miss PATRICIA LEWIS as their Press officer. Miss Lewis, who was born in Vancouver, British Columbia, joined the Canadian Broadcasting Corporation in 1948 as radio news editor for CBC radio and television newsrooms. Between 1957 and 1958 she travelled throughout Europe and at the beginning of 1958 joined *Good Housekeeping* as an assistant to the homes editor.

NINETEEN-YEAR-OLD MICHAEL ANTHONY COOPER, who works at the British Steel Casting Research Association in Sheffield, has been selected for an expedition which Sir John Hunt will take to Greenland in July. He is working for the gold standard in the Duke of Edinburgh's Award Scheme. Tony was the leader of a mountain rescue demonstration which Sir John saw during his visit to Sheffield in February. The expedition flies to Greenland on July 21 and returns on September 1.

EYRE
Aluminium Alloy Ingots



ESCO Gunmetal and Phosphor Bronze Ingots



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Raw Material Markets

Iron and Steel

Pressure is sustained by the steelworks for supplies of basic pig-iron; consumption of this grade continues to expand and, in turn, outputs at the blast furnaces are higher. Many producers, in fact, are obtaining record outputs. The difficulty in getting suitable scrap continues and compels the steelworks to use larger proportions of pig-iron in their mixtures. Demands from the ironfoundries for low-phosphorus iron for the production of high-quality castings continue to be heavy and there has also been a much bigger call of late for hematite pig-iron, due to the larger usage by the engineering and speciality foundries and to the increased requirements of the steelworks for ingot moulds and other heavy castings.

There is no slackening in the demand from the motor vehicle trade for castings and most of the foundries supplying high-duty castings to that and other important industries are able to obtain substantial outputs, with good prospects of business continuing at least at present levels for some time ahead. In the light-casting trade the demand for builders' castings has increased. There is some decline in the call for castings for domestic utensils; nevertheless, the foundries supplying them are fairly well occupied.

The overall outputs of pig-iron required by the ironfoundries appear adequate to cover present demands. The engineering and speciality foundries are able to cover their needs of the low-phosphorus irons, hematite, and refined irons for both consumption and stock, and for low-phosphorus irons and hematite there is now more forward buying. The supply of high-phosphorus pig-iron to the light, jobbing, and other foundries utilizing this grade is maintained up to requirements, and prompt attention is given to any urgent demands. In view of this position, and owing to the scarcity of forward bookings of castings, there is little intention or need on the part of these foundries to add to their stocks or to book for supplies beyond their immediate requirements.

Pressure continues from the re-rollers for supplies of steel semis, and they are taking up all available supplies in prime material and also in suitable re-rolling quality defectives and crops when these arise. There is a pressing need for 2-in. billets, which many of the steelworks supply at only infrequent intervals, and these are a necessity to a number of the re-rollers for their small mills producing the lighter sections.

For the larger sizes of billets there has been some slight falling away in deliveries, but this is not of such proportions to enable them to overcome their present difficult supply position, as production is almost entirely dependent on current deliveries due to shortage of stocks. Orders on hand for light sections and small bars and also reinforcing rods enable them to obtain good outputs, which could be increased at some units if suitable additional labour were available. Present order-books provide sufficient work to keep them going at full stretch for some time ahead.

Non-ferrous Metals

As expected, the US custom smelter price of copper was reduced at the end of last week by 2 cents to 33 cents a pound—the same price quoted by the producers. This price is for April delivery and was made necessary by the continued weakness in the price of scrap which, immediately prior to the custom smelter price reduction, had shaded further to 24¼ to 24½ cents a pound for delivery three months forward. Indeed, the present scrap price indicates a further drop in the custom smelter price as it is equivalent to an electrolytic price of around 30 to 30½ cents a pound.

Demand for copper in the US is not good and with Wall Street behaving in a disappointing fashion the outlook is for a lower price level in the near future. This seems to be the way consumers are thinking and translated into action, they are only buying to meet their immediate requirements. Elsewhere in the US the only other point of interest is that the Laurel Hill Refinery is still strikebound.

The London market felt the impact of the lower price in the US and cash copper dropped below £2[illegible] a ton. Selling pressure is not, however, heavy and the fact that stocks of refined metal in LME warehouses are so low is a sustaining factor. The backwardation is fairly steady at approximately £13 a ton. The outlook in London is for a continuation of the downward trend, but, unless and until available supplies rise rapidly, the quotation should not fall sharply.

Tin has been much in the news following the International Tin Council's meeting at which the export quota for producer countries was raised from 36,000 tons to 37,500 tons. On the face of it this action was surprising but, in fact, the increase in the quota does not mean a great deal as not all of the producer countries are able to fill their quota. Thus only about 35,300 tons are expected to become available to the market in the April-June quarter. On the other hand the council, by preserving the quota system, is exercising a useful function because stocks of tin, built up in certain countries, would be dumped on the market if the quota regulations were not in force.

The market took the news in its stride, although, on balance, prices went fractionally lower. The Singapore market liked the explanation and the Eastern quotation turned harder. In the US the market was hesitant but it is now hoped that it will settle down again. The New York price is fluctuating narrowly between $1.00 and $1.01 a pound.

Lead remains quietly steady in London and reasonably good in the States. Supplies on this side of the Atlantic are adequate without being burdensome—although it is reported that the supply position is easing on the Continent. The US price is holding at 12 cents a pound.

Zinc is a good market in London and in New York where it is on offer at 13 cents a pound. Overall demand is satisfactory and the outlook is for a continuation of the present trend. In London the price is still trying to break through the £90 a ton level.

Index to Vol. 107

The index to the JOURNAL, volume 107, covering the period July to December, 1959, has now been printed and is available to readers free of charge. Applications for copies should be addressed to the publishing office, FOUNDRY TRADE JOURNAL, John Adam House, John Adam Street, Adelphi, London, W.C.2. Subscribers who wish to receive copies of indices automatically as they are printed may apply for inclusion on a permanent mailing list. Those already on this list should not need to apply for their current copy.

BRITISH CHROME & CHEMICALS, LIMITED—Mr. W. H. Coates has been appointed a joint managing director of the company, which is a member of the Associated Chemicals Companies, Limited, group.

ARTHUR LEE & SONS, LIMITED—Mr. John M. Shaw has been appointed to the board and Mr. G. Wilton Lee and Mr. Arthur M. Lee, directors of the company, have joined the board of John Shaw, Limited.

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Imports and Exports of Iron and Steel in January

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in January this year. Totals for January 1959 are also included.

Total Exports of Iron and Steel

Destination.	Month ended January 31.		Month ended January 31.	
	1959.	1960.	1959.	1960.
	Tons.	Tons.	£	£
Cyprus	72	140	7,713	15,309
Sierra Leone	640	419	59,562	40,704
Ghana	740	2,108	64,015	107,154
Nigeria	4,149	6,186	286,305	416,211
Union of South Africa	7,771	7,013	588,234	600,457
Rhodesia and Nyasaland	980	1,506	78,121	107,689
Tanganyika	2,166	652	154,942	47,467
Kenya	3,292	2,036	208,180	116,863
Uganda	548	161	39,958	12,881
Mauritius	152	305	12,164	15,492
Aden	218	126	17,503	9,404
Bahrein, Qatar, and Trucial States	1,609	162	121,100	13,955
Kuwait	1,065	120	77,320	19,530
India	13,853	15,132	881,677	1,009,009
Pakistan	4,319	7,725	199,365	265,610
Singapore	1,891	1,970	147,125	150,444
Malaya	805	1,431	51,422	99,234
Ceylon	5,178	4,995	307,785	264,214
British North Borneo	214	322	20,498	17,329
Hongkong	5,423	6,363	210,755	241,347
Australia	10,332	13,743	901,605	1,062,391
New Zealand	7,591	7,538	573,825	504,049
Canada	9,482	23,148	805,846	1,364,933
Jamaica	2,016	1,890	140,339	142,731
Trinidad	3,062	4,376	193,039	365,205
British Guiana	586	533	31,525	34,608
Other Commonwealth countries	5,346	2,932	354,467	180,605
Eire	3,650	4,283	217,988	276,419
Soviet Union	228	2,214	15,043	982,591
Finland	2,110	3,047	143,463	252,935
Sweden	11,743	24,068	682,516	1,258,798
Norway	8,269	12,766	476,924	705,843
Denmark	5,936	9,367	407,302	619,854
Western Germany	11,149	19,543	344,054	857,691
Netherlands	3,551	11,093	232,658	637,894
Belgium	2,734	4,658	174,483	261,598
France	210	369	49,508	49,843
Switzerland	542	1,289	72,901	149,122
Portugal	1,693	1,139	115,684	92,399
Spain	1,448	1,142	150,429	115,122
Italy	2,974	4,605	191,780	227,516
Austria	260	462	45,369	80,417
Yugoslavia	76	168	7,222	7,421
Greece	546	1,723	28,106	81,880
Turkey	279	183	20,562	14,528
Netherlands Antilles	339	836	35,581	38,864
Portuguese East Africa	127	556	10,662	33,470
Egypt	105	1,366	8,149	62,783
Sudan	834	454	61,573	33,575
Lebanon	20	119	2,982	13,001
Israel	1,090	3,287	49,740	165,154
Saudi Arabia	221	25	42,788	3,422
Iraq	7,631	3,232	497,333	236,975
Iran	2,533	7,476	161,856	467,257
Burma	686	90	43,573	6,359
Thailand	1,593	1,710	116,280	125,956
Indonesia	287	2,641	25,786	207,692
China	10	7,451	6,867	633,465
Japan	1,863	8,608	43,507	179,181
Philippine Republic	319	1,647	23,519	113,362
USA	7,766	30,672	549,520	1,961,209
Cuba	342	970	24,065	76,956
Colombia	55	790	4,965	53,433
Venezuela	7,298	4,002	532,215	307,580
Ecuador	100	125	9,027	9,957
Peru	229	449	12,702	32,741
Chile	73	175	16,864	15,324
Brazil	923	2,439	75,032	178,102
Uruguay	174	840	16,048	62,616
Argentina	25,083	10,176	1,582,417	649,076
Other foreign countries	3,711	15,020	264,927	1,055,940
TOTAL	214,310	320,347	14,128,360	20,620,146

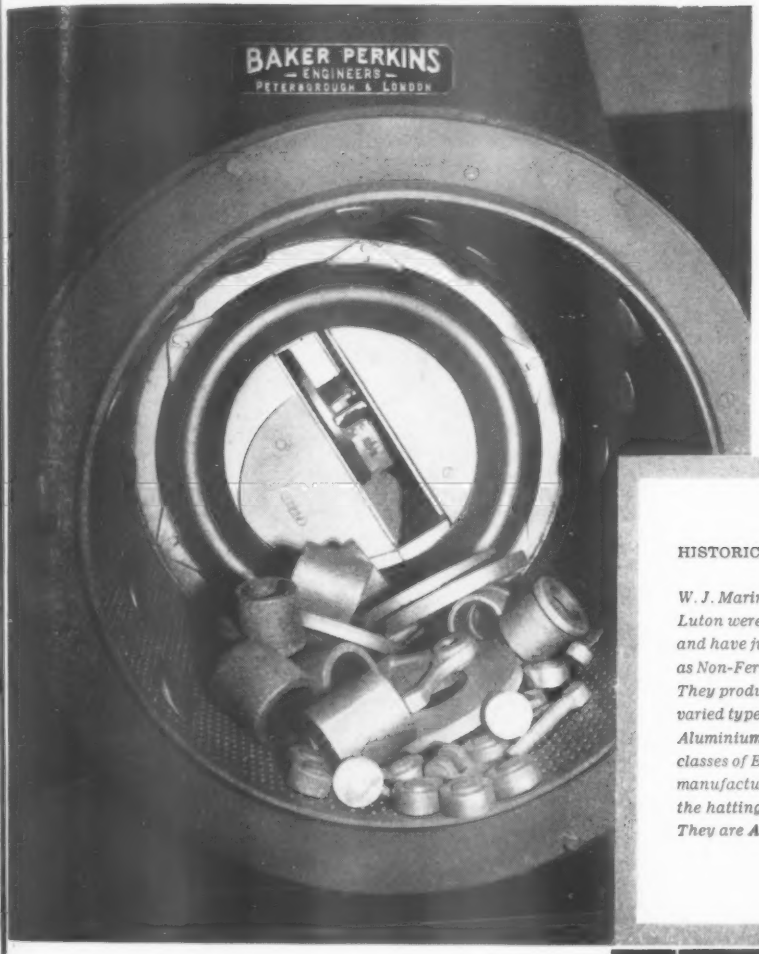
Total Imports of Iron and Steel

From	Month ended January 31.		Month ended January 31.	
	1959.	1960.	1959.	1960.
	Tons.	Tons.	£	£
Union of South Africa	1,576	3,593	102,132	216,8
Rhodesia and Nyasaland	103	995	17,412	123,9
Canada	118	3,438	58,777	243,8
Other Commonwealth countries and Eire	569	4,306	24,077	228,2
Soviet Union	705	4,428	44,452	122,9
Sweden	1,794	2,810	248,037	391,8
Norway	5,076	8,785	333,996	560,8
Poland	344	86	7,591	4,8
Western Germany	1,744	14,536	210,926	1,012,9
Netherlands	10,047	16,008	570,100	1,057,4
Belgium	1,357	4,573	49,087	332,0
Luxembourg	94	645	4,339	35,3
France	439	4,036	53,554	341,1
Italy	54	1,060	11,439	72,8
Austria	376	583	30,709	50,3
Japan	200	424	20,991	41,2
USA	476	2,293	92,268	256,3
Other foreign countries	834	869	69,460	55,1
TOTAL	25,906	73,468	1,949,347	5,147,7
Iron and steel scrap and waste, fit only for the recovery of metal	215	5,899	7,888	94,3

Exports of Iron and Steel, by Product

Product.	Month ended January 31.		Month ended January 31.	
	1959.	1960.	1959.	1960.
	Tons.	Tons.	£	£
Pig-iron	12,123	25,747	238,650	483,2
Ferro-columbium (niobium)	5	14	8,805	20,3
Ferro-tungsten	172	107	53,990	45,0
Other ferro-alloys	367	676	67,666	129,7
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars), and similar primary forms	7,619	5,562	214,953	191,0
Pieces roughly shaped by forging	23	45	4,520	6,3
Iron bars, rods, angles, shapes, and sections	64	208	5,170	10,5
Steel bars, rods, angles, sections, and shapes	21,036	60,636	1,326,731	2,991,9
Iron plates and sheets	173	36	5,888	2,0
Universal plates	1,337	1,848	64,931	86,1
Steel plates, 3mm. and under 4.5mm. in thickness	1,742	2,436	95,796	148,9
Ditto, 4.5mm. or more in thickness	10,593	24,391	520,774	1,148,3
Blacksheets and blackplate	18,325	29,456	1,378,533	2,212,7
Hoop and strip	6,091	7,644	496,638	639,9
Tinplate	41,470	57,648	3,076,078	4,365,9
Decorated tinplate	595	244	41,031	20,6
Galvanized sheets	6,788	5,245	504,260	381,9
Other (incl. tinned sheets, terneplate, and ternesheets)	844	4,195	78,702	333,7
Rail and tramway construction material	15,810	8,654	814,434	453,0
Wire rods of steel (incl. alloy steel)	3,444	6,984	139,358	322,7
Wire	8,299	9,708	709,927	838,4
Tubes, pipes, fittings	57,320	68,863	4,281,525	5,785,9
TOTAL	214,310	320,347	14,128,360	20,620,1

COPELAND & JENKINS, LIMITED—Mr. H. M. Robinson has been appointed a director.



HISTORICAL NOTE

W. J. Mariner & Co. Ltd., of Luton were established in 1909 and have just completed 50 years as Non-Ferrous Founders. They produce castings of very varied types and sizes both in Aluminium and Bronze for all classes of Engineering, and also manufacture very largely for the hatting industry. They are A.I.D. approved.

Baker Perkins Foundry Machinery at work . . . *at W. J. Mariner & Co. Ltd.*

This Turbo 60 Rotating Drum Airless Shot Blast Machine has been installed in the foundry of W. J. Mariner & Co. Ltd., Luton. The Turbo 60, with its effective load of up to 132 lb. and an output of up to 15 cwts. an hour, is easy to maintain and gives high performance at low cost.

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PHONE: JARROW 897124

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

March 16, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P. 0.10 per cent. max.: North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 10s. 0d. to £44 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 0s. 0d. to £62 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 11s. 8d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 14s. 8d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £78 10s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale 26s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £77 0s 0d. to £80 10s. 0d., basis 60 per cent. Cr, scale 26s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent, C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent. C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 10¼d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £63 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plates (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in. and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over. £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 1 0s. 0d., nickel-chrome, £99 4s. 0d.; nickel chrome-molyb denum, £111 17s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £249 10s. 0d. to £250 0s. 0d.; three months, £235 15s. 0d. to £236 0s. 0d.; settlement, £250 0s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 5½d. per lb.; rods, 263s. 6d. per cwt. basis; 20 s.w.g., 298s. 6d. per cwt.

Tin.—Cash, £791 10s. 0d. to £792 0s. 0d.; three months, £790 0s. 0d. to £791 0s. 0d.; settlement, £792 0s. 0d.

Lead (Refined Pig).—Second half March, £76 15s. 0d. to £76 17s. 6d.; second half June, £75 12s. 6d. to £75 15s. 0d.

Zinc.—Second half March, £89 0s. 0d. to £89 10s. 0d.; second half June, £87 15s. 0d. to £88 0s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £123 17s. 6d.; rolled zinc (boiler plates), all English destinations, £121 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £100 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 2s. 0¾d. per lb.; sheets to 10 w.g., 218s. 9d. per cwt.; wire, 2s. 10½d.; rolled metal, 218s. 9d. per cwt.

Brass (Brazing).—BS1400, B3, £162; B6, £218.

Brass (High Tensile).—BS1400, HTB1, £194; HTB2, £216; HTB3, £226.

Gunmetal.—BS1400, LG2, £203; LG3, £213; G1, 1% £270; G1, 1½. £257.

Phosphor Bronze.—BS1400, PB1 (AID released), £299; BS1400, 90/10/1, £288.

Leaded Phosphor Bronze.—BS1400, LPB1, £223.

Phosphor Bronze Strip, etc.—Strip, 303s. 6d. per cwt.; wire, 4s. 3d. per lb.; rods, 3s. 5½d; tubes, 3s. 6¾d.; chill cast bars; solids 3s. 5½d.; cored 3s. 6½d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide x 0.056, 4s. 0d. per lb.; round wire, 10g in coils (10 per cent.), 4s. 5d.; special quality turning rod, 10 per cent. ½ in. dia., in straight lengths, 4s. 4d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2¼d. to 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £70 10s. 0d. to £71 0s. 0d. Nickel. £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400) AB1, £251; AB2, £259.

* Average 68–70 per cent.

'Gases in Metals' Symposium

It has long been recognized that the minute traces of the gases, oxygen, hydrogen, and nitrogen, in a metal can significantly affect its mechanical properties and its service performance. In order to control these gaseous impurities, they must be measured accurately, and many new determination techniques have been evolved in recent years. A forthcoming symposium on the "Determination of Gases in Metals," organized by the Society for Analytical Chemistry in conjunction with the Iron and Steel Institute and the Institute of Metals, will review the present position and survey the latest techniques available. Papers covering each of the three gases will include the "Determination of Hydrogen in Cast Iron" by Mr. J. V. Dawson and Mr. L. W. L. Smith, of the British Cast Iron Research Association; other papers will deal with vacuum-fusion, carrier-gas, activation analysis, emission spectrometric, and internal friction methods of determination. The symposium will be held at Church House, Great Smith Street, London, S.W.1, on Tuesday and Wednesday, May 3 and 4. Further details and forms of registration may be obtained from the secretary, the Iron and Steel Institute, 4, Grosvenor Gardens, London, S.W.1.

Industrial Injuries Benefits for People Abroad

Rules about industrial injuries benefits for people who go abroad are being relaxed to allow unemployability supplement and constant attendance allowance to be paid for certain periods of temporary absence from Great Britain. This is done by the National Insurance (Industrial Injuries) (Benefit) Amendment Regulations, 1960 (SI 1960, No. 254), obtainable from the Stationery Office.

Increases in Capital

WATLING STREET TOOL & GAUGE COMPANY, LIMITED, Markyate (Herts), increased by £65,000, in £1 ordinary shares, beyond the registered capital of £10,000.

MORELAND HAYNE & COMPANY, LIMITED, millwrights, etc., of London, E.C.1, increased by £150,000, in £1 ordinary shares, beyond the registered capital of £150,000.

DORAN ENGINEERING COMPANY, LIMITED, Wednesfield, Wolverhampton, increased by £20,000, in £1 unclassified shares, beyond the registered capital of £20,000.

W. E. SYKES, LIMITED, gear specialists, etc., of Staines (Middx), increased by £300,000, in 10s. "B" non-voting ordinary shares, beyond the registered capital of £900,000.

GAYLORD EDWARDS & COMPANY, LIMITED, mechanical and general engineers, etc., of Nottingham, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £5,000.

AVERY-HARDOLL, LIMITED, manufacturers of pumps, tanks, reservoirs, etc., of Chessington (Surrey), increased by £200,000, in £1 ordinary shares, beyond the registered capital of £100,000.

VERITYS (MAXLUME), LIMITED, manufacturers of electrical lamps and instruments, etc., of Birmingham, increased by £99,900, in £1 ordinary shares, beyond the registered capital of £100.

BAXTER, FELL & COMPANY, LIMITED, iron, steel, mineral, and hardware merchants, etc., of London, E.C.3, increased by £240,000, in £1 ordinary shares, beyond the registered capital of £60,000.

GEORGE RUSHWORTH & SON, LIMITED (formerly J.G.G. (Colne), Limited), engineers, steel merchants, etc., of Colne, increased by £29,410, in £1 ordinary shares, beyond the registered capital of £100.

H. FORDSMITH, LIMITED, engineers, etc., of Manchester, increased by £40,000, in 1,000 7½ per cent. cumulative preference and 30,000 ordinary shares of £1 each, beyond the registered capital of £10,000.

RUSTON-BUCYRUS, LIMITED, manufacturers of excavating machinery, etc., of Lincoln, increased by £2,000,000, in 1,000,000 "R" ordinary and 1,000,000 "B" ordinary shares of £1, beyond the registered capital of £4,000,000.

HEPWORTH IRON COMPANY, LIMITED, Hazlehead, near Sheffield, increased by £577,000, in 5s. ordinary shares, beyond the registered capital of £23,000. Converted into a public company on September 10, 1959. The 2,300 ordinary shares of £10 each have been sub-divided into 5s. shares.

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Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

FOUNDRY MANAGER (42), M.I.B.F. seeks position in Scotland. Experienced Ferrous, Non Ferrous Castings and Patternmaking, Estimating. Would consider Technical Representative. Box FM479, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN seeks position, grey iron foundry up to 5 tons. Age 41. A.M.I.B.F. Capable of full control. Anywhere, but preference for Midlands.—Box FO474, FOUNDRY TRADE JOURNAL.

CHIEF ENGINEER (40), M.I.P.E., M.I.B.F., seeks similar position with prospects. Good background, experience mechanised foundries, associated machine shops, installation, maintenance and development. Salary £1,800-£2,000 plus housing. Northern England preferred.—Box CE492, FOUNDRY TRADE JOURNAL.

PRACTICAL FOUNDRY MANAGER/SUPERINTENDENT, Whiteheart, Blackheart, Grey, 14 years' executive jobbing or mechanisation desires post with progressive company, Wolverhampton area.—Box PF470, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

MERSEYSIDE IRON and Non-Ferrous Foundry with capacity of 120 tons per month invites applications for the position of MANAGER. Applicants must be capable of controlling Sales, Production, Quality, Labour and General Administration. A sound knowledge of Metallurgy and Sand Control techniques is essential, together with extensive experience of semi-mechanised production, loose pattern, and shell moulding. Non-contributory Pension Scheme and mileage allowance or car provided. Apply to Box ME447, FOUNDRY TRADE JOURNAL.

PATTERNSHOP FOREMAN required for expanding Patternshop of well-known medium sized Malleable Iron Foundry. Applicants should have experience in high-class wood and metal work. Knowledge of pressure cast plates and Epoxy Resin patterns would be an advantage. Previous supervisory experience desirable. Applications, stating age, qualifications and experience, to: PERSONNEL OFFICER, BRITANNIA IRON & STEEL WORKS, LIMITED, Bedford.

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Experienced Foundrymen for responsible positions in

FOUNDRY MANAGEMENT

A new re-organisation programme offers splendid opportunities to men with sound practical and technical experience in the production of alloy and carbon steel castings up to 15 tons by floor and machine moulding methods. Modern Plant. Staff Pension Scheme. Assistance with house purchase.

Applicants should write, giving full details of age, training and experience, to: The Personnel Manager, Ref. SFD/1, Teesdale Iron Works, Thornaby-on-Tees.

SITUATIONS VACANT—*contd.*

FOUNDRY FOREMAN required for Ferrous Foundry (mechanised) situated in South-East England. Must have experience in machine moulding and be able to control labour. Send details of experience, age and salary required to Box FO450, FOUNDRY TRADE JOURNAL.

IRON FOUNDRY FOREMAN required for Foundry producing castings up to 40 tons in weight with a weekly output of 40 tons and upwards. Previous experience in production of iron castings for Electric Power Generating Plant and auxiliaries is desirable though not essential. Pension scheme. Canteen. Applications, giving age, experience and qualifications, to be made to Box FO458, FOUNDRY TRADE JOURNAL.

SKILLED GENERAL MOULDERS required, used high-class engineering work 1 cwt. to 2 tons. Piece-work earnings £20-£25 for good men. Every assistance given to obtain lodgings, etc. Apply JOHN WHEELER & SON, Railway Foundry, Clay Lane, Langley.

FOREMAN required—Medium size expanding Aluminium Gravity Die Foundry, Birmingham area. Must be experienced and held similar position. Good prospects, pension scheme. Box FR455, FOUNDRY TRADE JOURNAL.

ASSISTANT to Foundry Manager required by Jobbing Foundry, South Eastern district. Estimating experience an advantage. Write, giving details of practical and technical knowledge, age and salary required, to Box AT436, FOUNDRY TRADE JOURNAL.

METALLURGICAL CHEMIST required to take charge of laboratory employing people on Chemical and Metallurgical Analysis in connection with a large Iron Foundry situated in a pleasant area of the South Coast. Housing available. Please reply in writing, stating age, experience and salary required. Box MC438, FOUNDRY TRADE JOURNAL.

WANTED enthusiastic young practical moulder as working charge hand. Must be practical moulder used to machine tool work, 1 cwt. to 2 tons. Able to make all own cores, moulds, castings, etc., and willing to train unskilled labour, etc., most important. Midland area. Every assistance with lodgings, etc.—Box WE472, FOUNDRY TRADE JOURNAL.

STEEL FOUNDRY

METHODS ENGINEER

required having experience of Drysand and Greensand Work. 5-day Week, Contributory Pension Scheme.

Please give full details of education, age and experience to —

THE PRODUCTION CONTROLLER,

The North British Steel Foundry Limited, Bathgate · West Lothian · Scotland

SITUATIONS VACANT—cont

HAND MOULDERS required for jobbing foundry. Experience of N. ferrous metals essential. Good wages conditions. Apply to Personnel De E.M.I. LIMITED, Blyth Road, Hayes, Mid

APPLICATIONS are invited for position of ASSISTANT FOUND FOREMAN at a Midland Ironfound Applicants should state age, experie and salary required to Box AF FOUNDRY TRADE JOURNAL.

REPRESENTATIVES REQUIR Well introduced Agents required several industrial areas in United K dom calling on Foundries to sell M Foundry Machines and Equipment. W to Sole Agents of Centrozap—Po National Metallurgical Industry—Foun Machinery and Equipment Divisio INTEGRAL TECHNICAL EQUIPMENT CO. LIMI 45 Cromwell Road, London, S.W.7.

WOOD and Metal Patternmakers Model Makers required. Plenty overtime and output bonus.—Stand Pattern Co. Ltd., 25a, Broadwall, Stam Street, S.E.1. Wat. 6875.

BROWN & POLSON, LTD., Traf Park, Manchester, 17, manufactu of maize starch and its derivatives, requ the services of a chemist in their Techn Service Department. The firm's produ find application in a wide variety industries, and it is the function of Technical Service Department to as customers to make the best use of th products and in finding new uses for the Problems are examined in the laborat and followed up in the customer's premi where necessary. Applications are inv from chemists not over 35 years of who have an interest in this type of and who, in addition, have either a deg or equivalent in chemistry, or have ha HNC in chemistry and have experience one of the following fields: Textiles, Pa or Foundry practice. A knowledge starch technology whilst advantageous not essential. Salary will be dependent qualifications and experience and will discussed at interview. Pension/Life Ass ance Schemes. Canteen Facilities Profit Sharing Scheme.

Melting Shop Manager

A foundry in the Glasgow area wishes to appoint a Manager for its steel plant.

He must be experienced in Basic Electric Arc steel making practice, the control of labour and fully conversant with the methods of chemical analysis. The position is a rewarding one in an efficient organisation where initiative is encouraged.

Please give details of experience, age, educational qualifications and salary required in your reply which will be in strictest confidence.

BOX MS 488
FOUNDRY TRADE JOURNAL

SITUATIONS VACANT—*contd.*

EXPERIENCED MOULDERS required to act as technical instructors in large South Wales Iron Foundry. Experience in production of large castings in loam, dry, and green sand. Duties will include training of apprentices and young moulders. This is a staff appointment and a contributory superannuation scheme is in operation.—Write giving details to: The Works Accountant, Guest Keen Iron & Steel Co. Ltd., Ivor Works, Dowlais, Glam.

ASSISTANT to Foundry Manager required by small expanding Alloy Steel Foundry, South Yorkshire area, combining jobbing and machine moulding practices. Preferably 25/35 years of age. Ability in handling foundry personnel, estimating and knowledge of modern sand techniques looked for. Apply Box AT489, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN aged 30-35 years required as first assistant to Foundry Manager at well known progressive non-ferrous foundry in N.W. manufacturing bronze and light alloy castings. A realistic expansion programme is in operation, and the appointment calls for a man of character, initiative and ability to control all grades of labour. Box FF481, FOUNDRY TRADE JOURNAL.

WORKS MANAGER for small Non-ferrous Foundry, Machine and Jobbing work. Situated near London Suburb. Estimation experience an advantage. Write giving details of practical and technical knowledge, age and salary required. Box WM480, FOUNDRY TRADE JOURNAL.

WORKS MANAGER. Non-ferrous Die casting Company in S.E. London area requires top line Works Manager. Age limits envisaged 40/50. Turnover currently approaching £500,000 p.a., approximately 250 employees. Basic salary according to experience but not less than £1,500 p.a. with bonus and superannuation. Board appointment to suitable applicant.—Write with full personal details to Box WM493. FOUNDRY TRADE JOURNAL.

AGENTS required in London and Manchester areas specialising in cast iron repetition castings. Foundry also produces non ferrous sand and Die castings Box AR478, FOUNDRY TRADE JOURNAL.

WAGES and Despatch Clerk required for Manchester Ironfoundry. Good knowledge of office routine essential. Knowledge of Foundry or Engineering products an advantage. State age and experience to Box WA 482, FOUNDRY TRADE JOURNAL.

RATE FIXER required by Engineering Company for their Foundry, experience in Foundry essential, apply Box RF483, FOUNDRY TRADE JOURNAL.

ASSISTANT METALLURGIST required for Steel Foundry operating Electric Arc Furnaces. Applicant should have training in metallurgy and chemical analysis and be of H.N.C. standard. Excellent prospects of advancement. Flat available if required. Apply, stating age and experience to Personnel Officer, The NATIONAL STEEL FOUNDRY (1914), LIMITED, Kirkland Works, Leven, Fife.

CHIEF METALLURGIST required to take full control of Laboratory and be responsible for metal and sand control, etc., in a large West Midlands Foundry producing castings for the engineering and automobile industries. Apply stating age, experience and salary required to Box CM484, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

GOOD OPENING in Midlands area for Foundry Manager. Applicants should have sound knowledge of floor, machine and mechanised production and preferably experience of cupolas, metal and sand control.—Write giving age, experience and history of previous employment to Box GO490, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN.—Well established aluminium foundry requires Foundry Foreman with practical experience in Gravity and Pressure Diecasting, moulding and melting of aluminium alloys. To take charge of Foundry employing 40/50 personnel and must be accustomed to handling labour. Staff appointment for capable person. Apply in writing, giving details of experience and salary required, to THE NORTHERN DIECASTING COMPANY, LIMITED, Norcastal Works, Burnley, Lancs.

REPRESENTATIVES required calling on Foundries in all areas to offer as additional line Moulding Box Pins and general maintenance of Foundry equipment, also general machining. Liberal commission. BRADSTEDS LIMITED, Bradley, Bilston, Staffs.

A FOUNDRY MANAGER required to control Malleable Iron Foundry in Midlands. Prospect of directorship for capable man, who can prove his worth. Experience more important than age. Pension scheme. Top salary. Write giving full particulars to Box 5086, MASON-PEACOCK LIMITED, 184, Strand, London, W.C.2.

WANTED.—Charge hand moulder/closer for steel foundry in North of England. Good rates of pay and Subsistence Allowance paid. Apply Box WC486, FOUNDRY TRADE JOURNAL.

MACHINERY WANTED

SECOND-HAND 30-cwt. or 2 ton capacity 3 motor travelling crane. Pendant controlled, approximately 40 ft. span, 440/3/50 supply. Box SH487, FOUNDRY TRADE JOURNAL.

WANTED.—Wadkin Semi-Auto Pattern Miller, Model WX. Must be in good condition. HENRY WALLWORK & Co. LIMITED, Roger Street, Red Bank, Manchester 4.

SHOTBLAST CABINET complete in good working order required by small foundry. FIELD FOUNDRY, 46, York Road, Acton.

ALL TYPES of BMM Moulding Machines, any condition. Good prices paid. Lawford Plant & Machinery Ltd., Brantham Mills, Cattawade, Manningtree, Essex.

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TWO BMM H.P.L.3 Pinlift Moulding Machines, as new.
Two 750 lb. Pneulec Jolt Rollover Moulding Machines.
Two Pneulec Jolt Squeeze Skirt Lift Machines. Table 16 in. × 17 in.
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Five Armstrong Pneumatic Rammers.
1-Ton Roper Rotary Receiver, as new.
30-cwt. Oil Bath Geared Ladle.
2-Ton Oil Bath Geared Ladle.
3-Ton Crane Ladle.
10-cwt. Racking Hoist with Trolley and Ladle.
Pneulec Core Sand Disintegrator.
Sinex Shake Out Beam, 1 ton cap.
Jackman Shotblast Cabinet, 3 × 3 × 3, complete with Dust Extraction Broom, Wade Compressor and Motor.
50 Pairs Jackman Steel Moulding Boxes, 25 in. × 20½ in. × 4 in., fitted Stays and Nitrided Bushes.
50 Pairs Bilston Steel Boxes, 14 in. × 21 in. × 4½ in.
200 lb. Aluminium Capacity Bale Out Oil Fired Furnace, complete.
Lawford Plant & Machinery Ltd., Brantham Mills, Cattawade, Manningtree, Essex.

MACHINERY FOR SALE—*contd*

FURNACE FOR SALE.—Manufactured by Carborundum. Oil-fired, 4 burners, cross fire. Size: 10 ft. back to front, 5 ft. wide. Full muffle type, complete with heat exchanger and charging forks. This furnace is ideally suitable for heat treatment or vitreous enamelling. Only in use for one year. Would dispose of for very low price for quick sale. Box FU475, FOUNDRY TRADE JOURNAL.

CHARGING FORK.—Single unit for sale. Incandescent manufacture, suitable for furnace 10 ft. back to front. Low price for quick sale. Box CF476, FOUNDRY TRADE JOURNAL.

10 CWT. Cupolette complete with blower and platform. One Brass Furnace, 150 lb. capacity, gunmetal, coke fired. Variety of Moulding Boxes.—Box CU456, FOUNDRY TRADE JOURNAL.

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FOUNDRY EQUIPMENT—SP.1000 fully automatic Shell Moulding Machine. Little used. Offers. Apply: J. J. TAFT, Idoson Motor Cylinder Co., Ltd., Hainge Road, Tividale, Tipton, Staffs.

SPECIAL OFFER—
THE FOLLOWING PRACTICALLY NEW EQUIPMENT FOR SALE AT BARGAIN PRICES.

Six new and unused Drawer type Core Ovens, by Alldays & Onions.
Pneulec 2-cwt. capacity motorised Sand Mixing Machine.
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Large stock of small Ladles.
200 Keith Blackman motor driven Blowing Fans in stock.
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1,000 new Shanks, Tongs, etc., and small Ladles.
New Bale-out and Lift-out Furnaces. Leaflet and photograph available.
New Polford 600 lb. capacity Coke Fired Furnace.
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BABY RAYMOND MILL with motors, now in use but surplus to requirements, for disposal. Definite offers only considered. Box BR469, FOUNDRY TRADE JOURNAL.

ONE "Incandescent" Gas Fired Tunnel Furnace, pneumatic push type, tunnel size 27 ft. × 1 ft. 10 in. × 1 ft. 7 in., complete with recording and control equipment.—Box IN491, FOUNDRY TRADE JOURNAL.

FOR SALE.—4-Ton Cupola complete with Dry Spark Arrester, unused. Also 20 h.p. Blower. TECHNALOY, LTD., Stocklake, Aylesbury.

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CASTING WEIGHTS calculated from drawings. Excellent postal service covering U.K. ELCO, 30, Calthorpe Road, Walsall, GREat Bar 3628.

FOUNDRIES FOR SALE

IRON FOUNDRY (London area) for sale as going concern. 15-20 ton a week. Good order book.—Box IF473, FOUNDRY TRADE JOURNAL.

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FOR SALE.—Two important French iron foundries, situated 150 kilometers to the west of Paris. Both foundries are in full activity, and doing a profitable business with a large group of major industrial users. The factories have a combined roofed area of 45,000 square meters, standing on 100,000 square meters. There are excellent opportunities for diversification of production. Full details can be obtained from the principals, c/o C.P.V.S. 48 bis, Ave. Kleber, Paris, 16e.

CAPACITY AVAILABLE

CASTINGS.—We can save your porous castings, ferrous or non-ferrous, by an approved impregnation Process; sample castings treated. A.I.D. approved.—RECUPERO, LTD., 66, South Harrow Viaduct, Harrow, Middlesex. 'Phone: Byron 1178.

BEEHIVE FOUNDRY, 50, Hall Lane, Walsall Wood (Brownhills 3323), for Aluminium Sand Castings up to 100 lbs. We specialise in core driers and all types of plates for foundry use.

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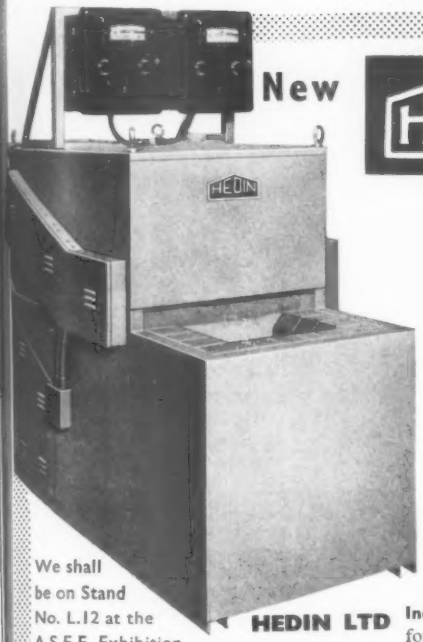

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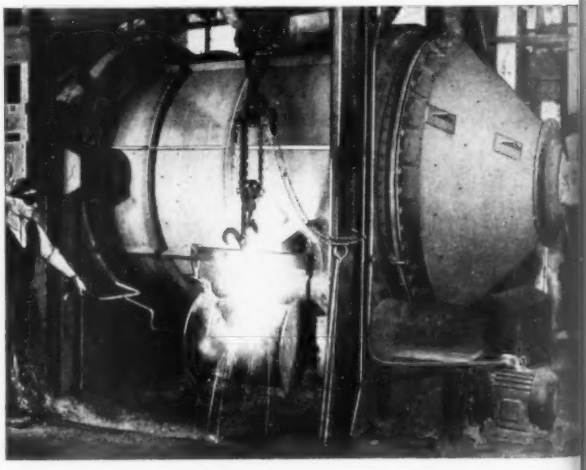

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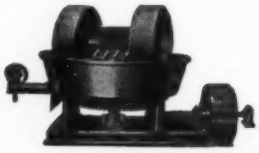

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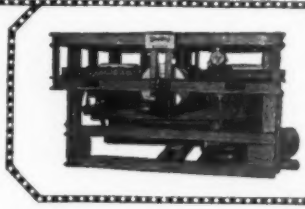

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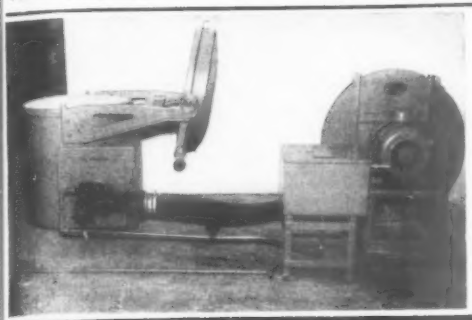

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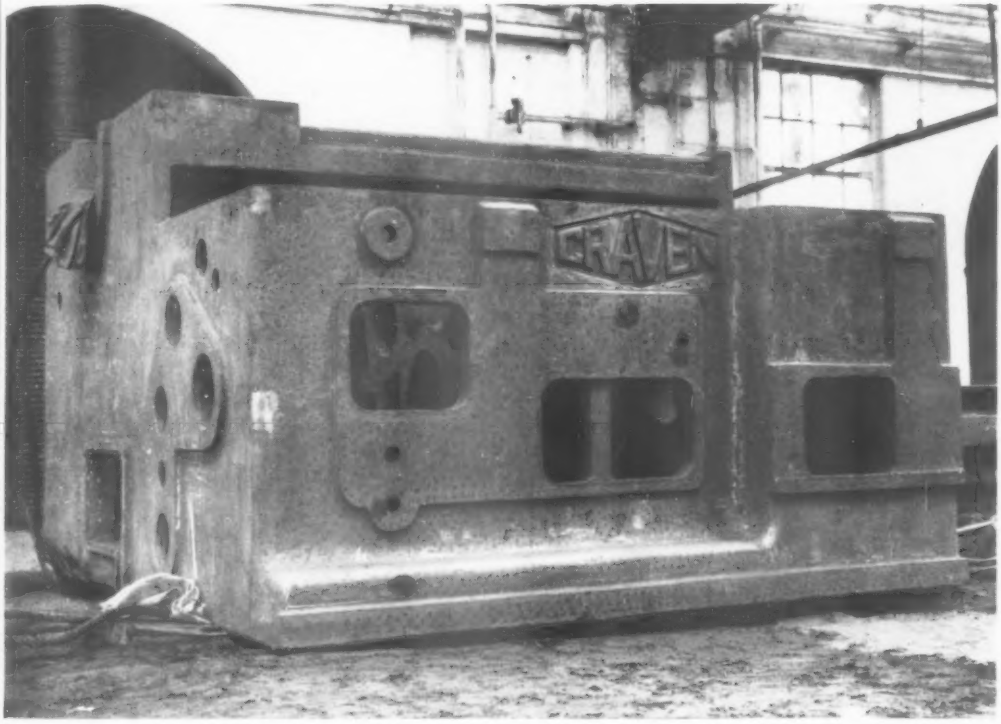

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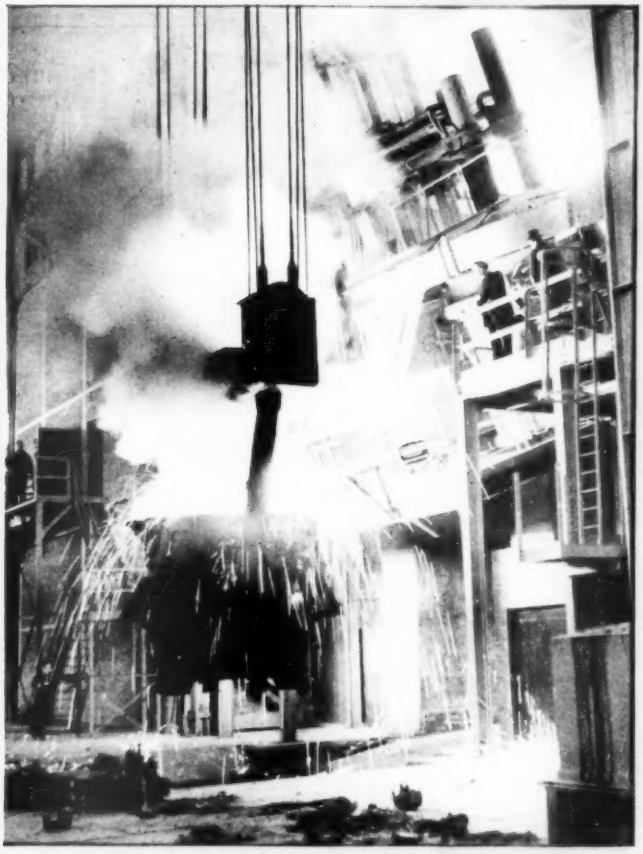
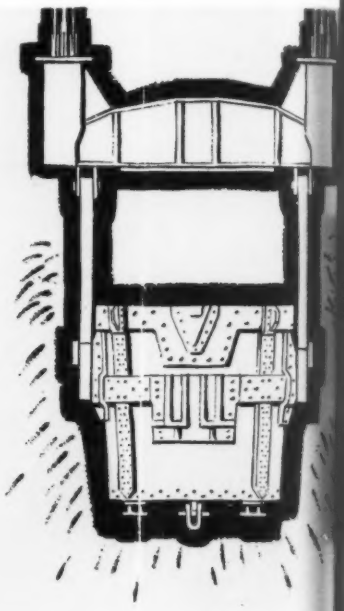


Tapping one of the three electric arc furnaces installed in the new melting shop at Brymbo Steel Works Limited, Wrexham.



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